GEOGRAPHY READERS II

THE UNITED STATES

I·O·WINSLOW

D·C·HEATH
&COMPANY
BOSTON

J. E. L.

II

THE UNITED STATES

UNITED STATES
Capitals of Countries:
Capitals of States:
Other Cities:
Principal Railroad Lines:
0 100 200 300 400 500
Scale of Statute Miles
Longitude
125°
120°
115°
110°
105°
100°
45°
40°
35°
30°
PACIFIC OCEAN
DOMINION
Vancouver
Victoria
C. Flattery
WASHINGTON
Seattle
Olympia
Tacoma
Mt. Rainier
Spokane
Columbia R.
Portland
Salem
Mt. Hood
Cascade Mts.
OREGON
MONTANA
Helena
Butte
Missouri R.
Yellowstone R.
YELLOWSTONE NATIONAL PARK
Regina
NORTH D
Bismarck
IDAHO
Boise
Snake R.
WYOMING
Deadwood
Black Hills
SOUTH D
Mt. Shasta
C. Mendocino
Sacramento
San Francisco
CALIFORNIA
Sierra Nevada Mts.
Yosemite Valley
San Joaquin R.
Mt. Whitney
Tulare L.
Pt. Conception
Los Angeles
San Diego
NEVADA
Virginia
Carson City
Great Salt L.
Salt Lake City
Ogden
Wasatch Mts.
UTAH
Grand Jc.
Cheyenne
Platte R.
NEBRA
Denver
Leadville
COLORADO
Pikes Peak
Pueblo
Rocky Mts.
KA
Grand Canyon
Colorado R.
San Francisco Mt.
ARIZONA
Phœnix
Gila R.
Tucson
Santa Fe
Albuquerque
NEW MEXICO
Canadian
Pecos R.
El Paso
TEX
MEXICO
Rio Grande
THE MATTHEWS-NORTHRUP WORKS.

95° Greenwich 90° 85° 80° 75° 70°
CANADA
Lake of the Woods
L. Superior
Duluth
Superior
Sault Ste. Marie
MICHIGAN
L. Huron
L. Michigan
Ottawa
Montreal
Quebec
St. Lawrence R.
Fredericton
St. John R.
MAINE
MT. DESERT
Portland
Augusta
Concord
N. HAMP.
VERMONT
Mt. Mansfield
Adirondack Mts.
Saratoga Sprs.
Albany
Catskill Mts.
Hartford
CONN.
Boston
C. Cod
Providence
Newport
MASS.
New Haven
LONG I.
New York
Trenton
Camden
Atlantic City
Dover
Annapolis
DEL.
Baltimore
Washington
Chesapeake Bay
Norfolk
Richmond
Petersburg
Toronto
L. Ontario
Rochester
NEW YORK
Buffalo
Niagara Falls
L. Erie
Erie
Cleveland
PENNSYLVANIA
Pittsburgh
Harrisburg
Philadelphia
Detroit
Toledo
Grand Rapids
Saginaw
Lansing
L. Michigan
MINNESOTA
St. Paul
Minneapolis
WISCONSIN
Milwaukee
Madison
IOWA
Des Moines
Chicago
Ft. Wayne
OHIO
Columbus
Wheeling
Cincinnati
INDIANA
Indianapolis
ILLINOIS
Peoria
Springfield
Kansas City
St. Louis
Jefferson City
MISSOURI
Ozark Mts.
Evansville
Cairo
Louisville
Frankfort
KENTUCKY
Mammoth Cave
Cumberland R.
Nashville
TENNESSEE
Chattanooga
Memphis
Fort Smith
ARKANSAS
Little Rock
W. VIRGINIA
Charleston
VIRGINIA
Appalachian Mts.
Mt. Mitchell
Raleigh
NORTH CAROLINA
C. Hatteras
Wilmington
SOUTH CAROLINA
Columbia
Charleston
Savannah R.
Atlanta
GEORGIA
Savannah
Chattahoochee R.
Tallahassee
Jacksonville
St. Augustine
FLORIDA
Pensacola
Mobile
Gulfport
ALABAMA
Montgomery
Alabama R.
MISSISSIPPI
Jackson
Vicksburg
Mississippi R.
LOUISIANA
Baton Rouge
New Orleans
Sabine R.
Galveston
Beaumont
Tampa
Palm Beach
BAHAMA ISLANDS
C. Sable
Key West
GULF OF MEXICO
ATLANTIC OCEAN
40°
35°
30°
25°
95° 90° 85° 80°

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GEOGRAPHY READERS—II

THE UNITED STATES

BY

I. O. WINSLOW

D. C. HEATH & CO., PUBLISHERS
BOSTON NEW YORK CHICAGO
1912

WINSLOW'S
GEOGRAPHY READERS

THE EARTH AND ITS PEOPLE
THE UNITED STATES
OUR AMERICAN NEIGHBORS
EUROPE
DISTANT COUNTRIES

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1 F 2

PREFACE

THE purpose of this series is to occupy middle ground between the customary text-books and geographical readers, and to combine the essential advantages of both.

The two extremes, whether employed separately or together, fail to meet the practical needs of the average schoolroom. The text-books adhere to the scientific method, at a sacrifice of the practical or pedagogical method. The teacher finds it difficult either to assign a definite lesson for study from the books or to use them for class exercises in reading and discussion. In their completeness the text-books contain so much that selection is difficult, and the attempt to teach the whole is disastrous.

Geographical readers, in the form of stories of travel, go so far to the other extreme that they also fall outside of the daily task of the geography teacher. Courses of study very properly call for definite concepts and facts. After serious attention has been given to these, there is but little time to spare in the regular curriculum for lighter reading.

There is need of books that shall select the essentials and set them forth in such an explicit and straightforward manner that they may be easily used, both for preparatory reading and for study and recitation. It is the design of these books to supply that want. Since they occupy a unique position, they should not be judged according to existing standards, but according to practical needs.

It is the purpose of this second book and the remaining books of the series to build upon the foundation laid in

Book One, and to complete a treatment of the essentials of an elementary course in geography. Such topics as have been given with full details in the primary book are omitted, or briefly mentioned, or treated from a more mature standpoint, in the later books.

Unusual attention has been given to the industrial and commercial aspects of the subject, in the belief that these are of fundamental importance and of natural interest to children. The fact that political geography, or the geography of locations, is wrought out in close connection with such industrial and commercial development renders it more significant and more easily remembered.

Topics of fundamental importance are fully explained in the text, but many minor points, which may be easily ascertained or inferred by pupils, are reserved and given at the end of each chapter, either in the form of questions or brief statements accompanied by questions. These exercises, supplemented by map sketching and other work that is here and there suggested, will provide definite lessons for the study period, which many teachers find it difficult to arrange.

The review questions relate to principal points explained in the text, and may be employed either for the daily assignment of lessons or for occasional review. It is believed that these questions, together with the exercises given in connection with each chapter, include as much as pupils of elementary grades should be expected to learn.

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NORTH AMERICA
Scale of Statute Miles
0 100 300 500 1000
Capitals: ⊙ Other Cities: •
THE M.-N. WORKS
ARCTIC OCEAN
GREENLAND
(To Denmark)
ICELAND
(Den.)
Baffin Bay
Davis Strait
BAFFIN LAND
ARCTIC ARCHIPELAGO
ARCTIC CIRCLE
Bering Sea
Bering Str.
Pt. Barrow
ALASKA
Yukon R.
Mt. McKinley
Mt. St. Elias
KADIAK I.
KLONDIKE
Dawson
Mackenzie R.
Great Bear Lake
Great Slave Lake
Mt. Logan
Sitka
DOMINION OF CANADA
L. Athabaska
Hudson Bay
James Bay
LABRADOR
NEWFOUNDLAND
Gulf of St. Lawrence
Grand B.
Nelson R.
Lake Winnipeg
Winnipeg
Quebec
Montreal
Ottawa
St. Lawrence R.
St. John
Halifax
NOVA SCOTIA
Boston
New York
Philadelphia
Baltimore
Washington
Toronto
The Great Lakes
Minneapolis
Chicago
Omaha
Kansas City
St. Louis
Ohio R.
Missouri R.
Mississippi R.
Arkansas R.
Red R.
Appalachian Mts.
C. Hatteras
BERMUDA IS. (Br.)
ATLANTIC OCEAN
New Orleans
FLORIDA
Florida Str.
BAHAMA ISLANDS (Br.)
C. Sable
Gulf of Mexico
Havana
CUBA
WEST INDIES
GREATER ANTILLES
HAITI
PORTO RICO (U.S.)
JAMAICA (Br.)
Caribbean Sea
YUCATAN PENINSULA
BRITISH HONDURAS
GUATEMALA
HONDURAS
SALVADOR
NICARAGUA
Lake Nicaragua
COSTA RICA
Colon
Panama Canal
ISTHMUS OF PANAMA
Panama
CENTRAL AMERICA
SOUTH AMERICA
Mexico
Vera Cruz
Acapulco
MEXICO
Rio Grande
Sierra Madre
Gulf of California
LOWER CALIFORNIA
C. San Lucas
TROPIC OF CANADA
PACIFIC OCEAN
QUEEN CHARLOTTE IS.
VANCOUVER
Victoria
Vancouver
Cascade Range
Columbia R.
Seattle
Cape Mendocino
San Francisco
Sierra Nevada
Coast Range
Great Salt Lake
Los Angeles
Colorado R.
UNITED STATES
Mountains
Missouri R.

THE UNITED STATES

The subject of this book is our own country. The name United States comes from the fact that we have many separate states united in one. Among foreign people our country has been known as the United States of America, but it is becoming customary to use the briefer name America and to call our people the American people. This name is from that of Americus Vespucius, one of the early explorers of our coast. It is a pity that the country did not receive the name Columbia from that of Christopher Columbus, who was the first explorer to cross the Atlantic, and who deserves the greater honor.

Great Seal of the United States

The United States is, in many respects, the most interesting country in the world. It should certainly be of greatest interest to us. It is so vast, and its different parts differ so greatly from one another, that to know it well is to know much of the subject of geography. After we understand thoroughly the geography of the United States, it will be easy to understand the geography of the remaining countries of the world.

Our country occupies the best part of the continent of North America, and we shall begin by giving some attention to the entire continent.

1. The Physical Features

The most interesting part of geography is that which gives us a knowledge of the occupations and habits of the people who dwell in a country. But we should also understand why the people live where they do and why they are engaged in certain occupations, and we

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Scene in the Appalachian Mountains, North Carolina

shall learn much about these reasons by a study of the physical features and the climate.

The welfare of the people of a country depends largely upon the form of the land surface, and especially upon the height of its different regions above the level of the sea. Mountain ranges and the elevation of other regions of land make great differences in temperature, in winds, and in the amount of rain and snow.

North America, like other continents, was once beneath the ocean and was slowly raised above the water by the shrinking and wrinkling of the earth's crust. In some places there were long ridges, and these became mountain ranges. Because the regions that are crossed by mountain ranges have been pressed upward, the land near the mountains is generally high above sea level.

Scene in the Rocky Mountain Region

In some places the hard crust was broken and thrown up in ridges, forming an uneven surface. In others large sections were raised without much folding, producing extensive regions of comparatively level land high above the sea. A region of this kind is called a plateau.

Two great highland regions, with systems of mountain ranges, extend across North America. In the eastern part is the Eastern Highland and the Appalachian system of mountains. Across the Western

Highland there are several mountain ranges, the loftiest of which is the Rocky Mountain system.

Relief Map of North America

The mountains of the Appalachian system have been worn down much more than the mountains of the

West. The highest of the Appalachian Mountains is not much more than a mile high, while some of the mountains in the West are more than three miles high. In some places, as in the state of Maine, the mountains have been worn away until only low hills remain.

North of the United States, in the eastern part of Canada, there is a highland of less importance, called the Laurentian Plateau.

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A Prairie Scene

Southeast of the Appalachians the land slopes toward the Atlantic Ocean and the Gulf of Mexico. This section is called the Coastal Plain. In the central part of the country there is a gentle slope from the mountains on both sides toward the Mississippi River. This section is called the Great Central Plain. Some of the most nearly level parts of this plain are called prairies. A more elevated, but comparatively level section, east of the Rocky Mountains, is called the Great Plains.

1. Give the names of the different mountain ranges in the western part of North America. (See the map facing page 1).
2. Which of these is farthest east?
3. Give the names of six large rivers in North America.

4. Name the three oceans that border on North America.
5. Name several large gulfs and bays.
6. What large island is east of the Gulf of St. Lawrence?
7. What group of islands is east of the Gulf of Mexico?
8. Sketch a map of North America, showing the mountain ranges, the principal rivers, and the names of the large bodies of water around it.

2. Climate

The prevailing weather, or climate, of a country has much to do with making it desirable as a home for man. The temperature, the motions of the air in winds, and the amount of rain are matters of great importance.

The air has weight and everywhere presses down against the earth. Warm air is lighter than cold air. Hence, whenever a body of air at any place on the earth becomes warmer than another body near it, the heavier cold air moves under the lighter warm air and forces it upward. When the wind blows, a body of air is moving toward a region where the air is lighter.

It is easy to think of illustrations of such movements of the air. Smoke rises from a fire because the hot air is rising and carrying the particles of smoke upward. There is a good illustration in breezes at the seashore. In warm summer days the surface of the land becomes warmer than the surface of the ocean. On this account the cooler and heavier air over the water moves toward the land, pressing upward the warmer and lighter body of air. At night the reverse is true. After the sun sets, the land cools faster than the water and the air moves toward the sea.

The prevailing winds and the temperature vary greatly in different parts of the United States. In the western part the winds generally blow over the land

from the Pacific Ocean. These winds are not very cold in winter and not very warm in summer. The temperature of the ocean changes very slowly and is not much lower in winter than in summer. The surface of the water is warmer in winter and cooler in summer than the surface of the land. Hence the winds on the Pacific coast make the temperature in winter and summer much more even than it would otherwise be.

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Winter Scene in Southern California

Across the entire northern part of the United States the prevailing winds are from the west, but as the land over which they blow becomes cold in winter and warm in summer there is a corresponding difference in the temperature of the air, hence these winds tend to increase the extremes of heat and cold in the eastern portion of the country.

In the eastern parts of the United States the winds are variable. At all times, except in the hot midsum-

mer, the west winds are generally cool. But sometimes the wind blows over the land from the southeast or south, bringing warm air from the ocean or the Gulf of Mexico. Sometimes it blows from the northeast, bringing chilly air from the colder water farther north.

Over the Great Central Plain, where there are few mountains or hills to check its force, the wind sometimes blows violently. The air moves easily north and south, carrying warm air into the colder regions and colder air into the warmer regions, thus making the cold of winter and the heat of summer less severe.

Wherever water is exposed to dry air some of it evaporates. This means that the water changes to invisible vapor and passes into the air. After a certain amount of moisture has mingled with the air, the process of evaporation cannot continue. In warm air, however, there may be more moisture in invisible form than in cold air. When a body of air filled with moisture cools, some of the moisture collects in tiny drops. This form is called fog, or mist, or a cloud. When moisture enough collects in this manner, raindrops, snowflakes, or hailstones, are produced.

The air gathers some moisture from the land, but more from the surface of the ocean. As the wind blows, the air is carried from the ocean over the land, and when it is cooled, rain falls. If there were no wind to bring moisture from the sea, there would be but little rain on the land, and every country would be a desert.

The air may be cooled enough to cause rain by rising from the earth into colder regions above, by passing over mountains, or by mingling with other colder cur-

Winter Scene in Northern New England

rents of air. Rain may fall from the air in showers when a body of moist air becomes heated and rises into cooler regions, as in the afternoon of a warm day.

In the northwestern part of the United States west winds from the Pacific Ocean bring an abundant supply of moisture. As the air is cooled when it is raised to a higher altitude in crossing the mountains, a large amount of rain falls. After the air has crossed the mountains,

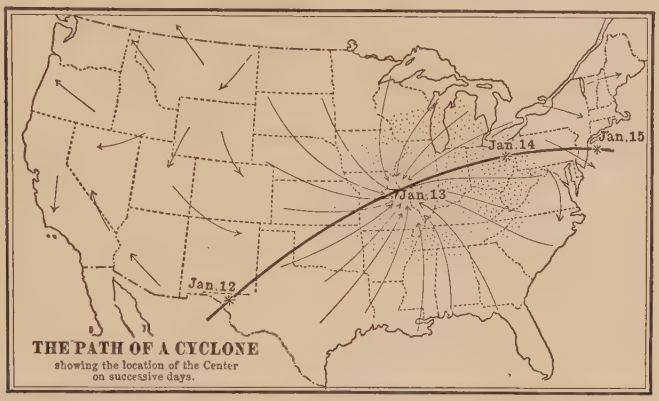
it is drier and is not often cooled enough to produce much rain. Hence the climate is dry east of the mountains.

In the eastern part of the country much moisture is brought by winds from the Atlantic Ocean. As the Appalachian Mountains are not very high, the air in passing over them is not cooled enough to condense a great amount of its moisture, and much is carried to the region west of the mountains. In the central part of the country the moisture is increased by winds from the Gulf of Mexico.

A small Western Cyclone

Most of the rain in the northern and eastern parts of the United States occurs in cyclonic storms. These storms usually commence in either the northwestern or the southern part of the country and move to the east or the northeast. Sometimes they continue across the ocean to Europe. Occasionally a storm begins in the West Indies and moves first northwest, then northeast, over a section of the country near the Atlantic coast.

The air in the center of a cyclonic storm is rising, and the air everywhere round about moves toward the center and whirls about it in a direction opposite to that of the hands of a clock. When a storm is approaching, the wind usually blows from the southeast, east, or northeast. After the storm center passes, the wind is usually from the north, northwest, or west.



THE PATH OF A CYCLONE
showing the location of the Center on successive days.

A cyclonic storm may cover so large an area as to produce rain at the same time over a region a thousand miles wide. There may be two or more storm centers over the country at the same time. A weather map shows where storm centers are located, the directions of winds, the pressure of the air, and the temperature in different parts of the country.

The Weather Bureau of the United States has stations scattered over the country from which reports are frequently received. From these reports is made a forecast of what the weather will probably be for the following day or two. The work of the Weather Bureau is of great convenience and value to millions of people.

By the annual rainfall of a region is meant the amount of rain, snow, and hail that falls in that region in a year. It is expressed in inches of depth. When we say that a certain region has a rainfall of twenty inches, we mean that if all the rain that falls in that region for a year, together with all the melted snow and hail, should remain upon the surface of level land, it would be twenty inches deep. In the state of Washington, on the western slopes of the mountains, the annual rainfall is more than a hundred inches, but there are regions east of the mountains where it is not more than five inches. Wherever the rainfall is less than twenty inches, the climate is considered too dry to produce farm crops.

1. Why will a piece of paper rise when placed over the chimney of a burning lamp?
2. Why is the west wind warmer in summer in the eastern part of the country than in the western part?
3. Why is there usually less snow upon the ground in winter near the seacoast than in places at a distance from the coast?
4. Why are there often clouds around mountains when the air is clear on the lowlands?
5. Why is the air more clear and dry in the eastern part of the country when the wind blows from the west than when it blows from the east?
6. What would be the effect upon the rainfall of the United States if the wind never blew in any other direction than from the west?
7. If the Appalachian Mountains were much higher than they are, what effect would this have upon the amount of rain in the central and eastern parts of the country?

3. The People

The Indians, who inhabited the United States before the white settlers came, were of different classes. Many of them roamed about from place to place, hunting, fishing, and fighting. Others lived in villages, and the

women and children raised a little corn and tobacco, while the men went away to hunt or engage in war.

In the southwestern part of the country there lived a few tribes of Indians who were more nearly civilized. Besides cultivating the land, they made articles from gold and silver, and pottery from clay, and knew how to weave blankets.

Kiowa Squaw, Papoose, and Teepee

As white people settled the country farther toward the west they conquered all the tribes of Indians and took them into their charge. The United States Government has placed the Indians on lands set aside for the purpose in different parts of the country. These lands are called Indian reservations. This arrangement is really no hardship for the Indians. They are simply deprived of the privilege of wandering over the country and hunting and fighting whenever they choose. The amount of land in the Indian reservations may seem small, but their number is very small in comparison with the population of the country. All the Indians of the country together would amount to less than one half as many people as there are in the city of Boston. There will be land enough for all of them upon their reservations when they learn to cultivate the soil and to live as white people do.

Nearly one third of all the Indians of the country live in the state of Oklahoma. This state was once called Indian Territory because a large part of it was occupied by tribes of Indians. Many white people settled among the Indians and many white men married Indian wives. The Indians gradually adopted the habits of civilized life, and they were finally induced to give up their tribal customs and to divide their land

Sioux Indian Camp

into separate farms. The territory afterward became a state and the Indian inhabitants became American citizens.

There are small Indian reservations in Maine, New York, and Florida, and larger ones in the western part of the country.

Formerly the Government supplied all the Indians with food and clothing. Now they do not receive supplies, but are assisted in finding work to do instead. At some time probably all the Indians will learn to live upon farms and support themselves.

The French people who once settled in Canada went down the Mississippi River to its mouth and took pos-

session of the Mississippi Valley. They called the region Louisiana in honor of their French King Louis.

The Spaniards, who gained possession of Mexico, included in their territory a section of what is now the western part of the United States, extending as far north as San Francisco. The present state of Texas also was once a part of Mexico.

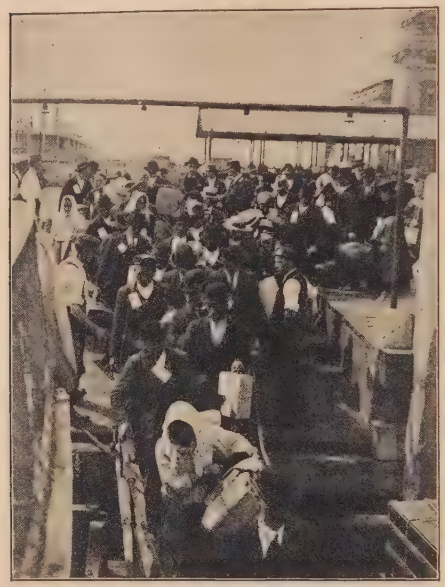
Old Mission built by the Spaniards
San Fernando, Calif.

The English at first had only a narrow section between the Appalachian Mountains and the coast. The settlements there were colonies of Great Britain, but they gained their independence in the war of the Revolution and afterwards succeeded in getting possession of the whole country from the Atlantic to the Pacific.

There are now many other people in this country besides the Indians, the English, and the French and Spanish who first settled here.

Negroes were first brought from Africa to Virginia as slaves in the year 1619. Afterward large numbers were brought to work on plantations in the Southern States, where cotton, sugar, and rice are raised. The

negroes were made free by the Civil War. Most of them still live in the South, but some have gone to the states in the North and the West. There are now over nine million colored people in the country.



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Immigrants landing at Ellis Island, New York

A large number of immigrants have come to the United States from the countries of Europe, and some Chinese, Japanese, and others, from Asia. There is room enough for all, and the people of this country are willing to receive as many as will become good citizens, but we have laws which forbid the admission of criminals and paupers and other undesirable people.

1. The eastern half of the United States contains nearly nine tenths of the people of the country. Give reasons for this.

2. At the close of the Revolutionary War there were about four million people in the country. Where did most of them live?

3. Why are many of the people of Texas of Spanish descent?

4. La Salle raised the banner of France at the mouth of the Mississippi in the year 1682. How long ago was that?

5. The Indians had no domestic animals such as horses or oxen. How did this fact make it more difficult for them to cultivate the land?

6. There are about 285,000 Indians in the United States. About how many other people are there for every Indian?

4. The Government

We have reason to be proud of the government of the United States. There is no other country in which the attempt to give all the citizens a right to take part in managing public affairs has been so successful.

The people of the United States have been glad to expend large sums of money for the education of all the

The Capitol at Washington

children in public schools. This is not only to benefit the children, but also because without such general education it would be impossible for our government to continue.

The first colonists from England came in companies and settled at different places along the Atlantic coast. The people of each company chose a simple government, adopting forms to which they had been accustomed in England. Some of the companies that settled on the New England coast were parts of church congregations who, with their pastors, had left

England because they were not satisfied with the way in which church affairs were managed. In this country the members of each congregation naturally wished to live near each other in order that they might be able to attend the same church.

Another reason why these early settlers made their homes so near together was that but little of the land was good for agriculture. On this account there were no large plantations. The families of a community lived close together, each one cultivating only enough land to supply its wants. By living in this way they were also better able to defend themselves against the Indians.

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Old Town Hall at Marblehead, Mass.

It was natural that these communities should select a form of government similar to that of the parishes in England. They organized what have been known since that time as towns or townships.

Those who settled in Virginia and along the coast farther south found it profitable to engage in farming on large plantations. This made their homes more scattered than those of the settlers farther north, and they naturally adopted the county form of government, which applies to a larger extent of territory than the township.

In the states farther west that were mostly settled at first by New England people the township form of government was generally adopted. In others counties were at first established. As the country has become more fully settled, counties have been formed by uniting several towns under a county government; and where counties were at first formed, many of these have been divided into smaller parts with separate township governments.

Wherever the number of inhabitants of any town becomes so large that the town government is unsuitable, a city government is adopted.

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Old County Court House at Portsmouth, Va.

We have thus five forms of government, applying to the township, the city, the county, the state, and the nation. Matters that concern the interests of the nation as a whole, and that could not be so well managed in the smaller localities, are in the charge of the national government. Other affairs are managed by the governments of the separate states. Still other affairs are left to the people of the counties, the cities, and the towns, with their local forms of government.

The capital city of the whole country is Washington, in the District of Columbia. The President resides in Washington, in a house called the White House, and

the senators and representatives from all the states meet in the Capitol Building to make laws for the country.

The District of Columbia is not a part of any state, but belongs to the whole nation. The city of Washing-

The White House and the President's Office

ton was selected by George Washington for the national capital at a time when it was only a village. At that time there were no states except those along the Atlantic coast, and Washington was in nearly a central location.

1. Why would it be a poor plan to have no form of government except the national government?

2. Why would it not be so well to have state governments, without any national government?

3. What would be the difficulty in a time of war if there were no national government?

4. Why would it not be so well for each state to take charge of carrying the mail, instead of the national government?

5. Why would it not be so well for each state to make the money to be used by its own people?

6. Why is it not necessary that the capital city of each state should be the largest city of that state ?

7. Between what states is the District of Columbia ?

Glaciers forming at the Summit of the Cascade Range

5. The Great Glacier

There are many things connected with the geography of the northern part of the United States that we cannot understand until we know the story of the Great Glacier, or Ice Sheet, which once covered that part of the country. We know that there must have been such a glacier because the effects that we see are precisely like those produced by glaciers at the present time.

In temperate regions of North America the snow that falls upon the ground in winter melts away as soon as the weather becomes warm. Farther north, where the

winters are longer, the ground is covered with snow for a greater part of the year. Still farther north so much snow falls in the long winter, and the summer is so short, that there is not time for all the snow to be melted, and the ground is always covered.

On the tops of high mountains in temperate regions it is as cold as in the far north. Since there is not

Moraine left by an Oregon Glacier

warm weather enough on these mountains to melt as much snow as falls in the colder weather, the snow becomes deeper and deeper and by its great weight is pressed into masses of ice.

These masses, which are called glaciers, do not remain at the tops of the mountains, but slowly move down the mountain sides and along the valleys. Some glaciers appear like great rivers of ice. Their motion, however, amounts to only a few inches or a few feet in a day. It is difficult to understand how a glacier can move at all and yet move so slowly. But we know that

even on level ground a very deep mass of ice would gradually become flattened and its edges pressed out in various directions. In a similar manner a piece of soft wax is slowly flattened and spread out when a weight is placed upon it.

A Glacier in Alaska

As a glacier moves along over the rock of a mountain it is so heavy and presses with such great force that it breaks off and drags along pieces of rock, grinding them into smaller pieces and grinding the rock beneath into sand or soil.

When the ice has been pushed down the mountain to a region where the weather is warm enough, it is melted, and the water flows away to form brooks and rivers. At points where this occurs the soil and rocks that were in the ice are left in a mass, called a moraine, or are washed farther down by streams of water.

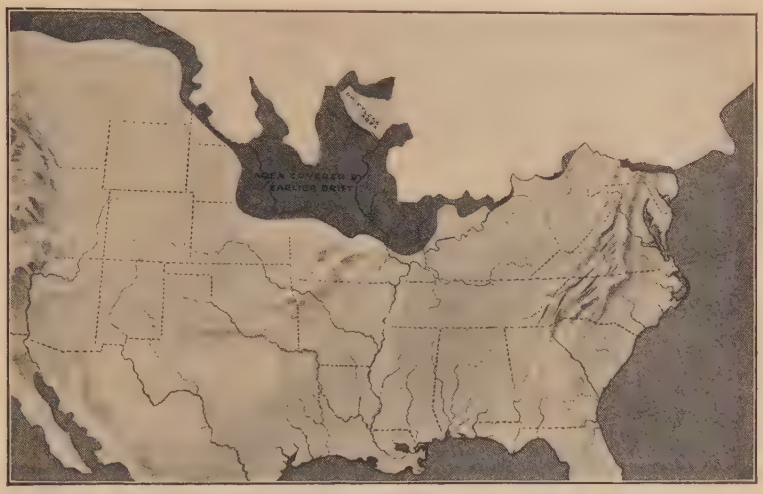
In some places along the coast far to the north the weather is not warm enough to melt the front of a glacier before it reaches the ocean. The front is slowly pushed out into the water and from time to time great pieces break off and float away until they are melted. Such floating masses of ice are called icebergs.

An Iceberg

Nearly the whole of Greenland is covered with an immense glacier. In the central part the ice is piled up thousands of feet deep. This ice moves slowly toward the coast. In the southern part of Greenland, in the summer season, the ice is melted before it reaches the ocean and there is a little bare ground, but elsewhere the ice is pushed out into the sea and breaks off in icebergs, some of which are hundreds of feet wide. These float away in the ocean to the south, where the water is warm enough to melt them.

Thousands of years ago there was a period of time when the climate of North America was colder than it

is now. In parts of the country where the snow now melts in the spring, it was then so cold that the snow accumulated and formed an immense glacier like that which covers Greenland. It reached across what is now Canada and the northern part of the United States. This vast sheet of ice slowly but constantly moved to-



Map showing the Southern Limits of the Great Glacier

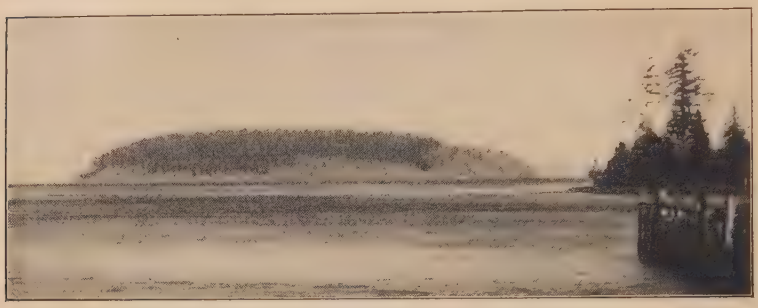
ward the south until the front edge reached a climate warm enough to melt it away as fast as it was pushed along. The time when this occurred is called the Ice Age or the Glacial Period.

1. Why do glaciers in cold countries extend as far as the sea, while those in warm countries do not?
2. There are many small glaciers in the Rocky Mountains. Why are there none in the Appalachian Mountains?
3. Why does muddy water flow from the front of a glacier?
4. Why is it dangerous for vessels to sail where there are icebergs?
5. How can we tell by the scratches on rocks in what direction the Great Glacier moved?

6. Why are these scratches parallel to each other?

7. Give the names of the states across which the front edge of the Great Ice Sheet extended.

8. Make a map of the United States, showing the line of the front of the Great Glacier at the time when it extended farthest south.



Island in Puget Sound, rounded by a Glacier

6. Effects of the Ice Sheet

The Great Ice Sheet made many wonderful changes in the northern part of our country. Some of these changes are of great benefit to the present inhabitants and some are a disadvantage.

Many of the hills of the country were formed by the ice. In some places the soil and rocks under the ice became heaped up, and as the ice moved over such masses it formed smoothly rounded hills. There are many such hills in the state of Massachusetts and in other regions which were covered by the ice.

In places along the front or beneath the front of the ice, where it melted away as it moved forward, the drift was piled up in deep masses. Streams from the melting ice washed out valleys in this moraine and carried some of the drift a long distance. Many hills in the south-

eastern part of New England, and some islands near the coast, are parts of the moraine of the Great Glacier.

As the climate gradually became warmer the front of the ice sheet melted faster than it moved forward and left the ground covered with drift. On this account much of the soil in the northern part of the United States consists of glacial drift.

In some of the regions that were covered with ice there are many rocks of various sizes, with edges and corners worn away. Some of these lie upon the soil;

Pasture Boulders left by a Glacier

others are buried in it. Because these rocks are unlike the rock under the soil in the locations where they are found we know that they must have been carried to their present positions from other regions. It has been found that they must have been brought by the Great Glacier from regions farther north. Large rocks of this kind are called boulders.

Streams that flow into ponds and lakes are constantly depositing soil. After a long time the ponds and lakes are entirely filled with soil, and become level land with streams flowing through it. We may be sure that those which have not yet been filled are not very old.

Most of the ponds and lakes of the country were caused by the Ice Sheet. Although the many thousand years

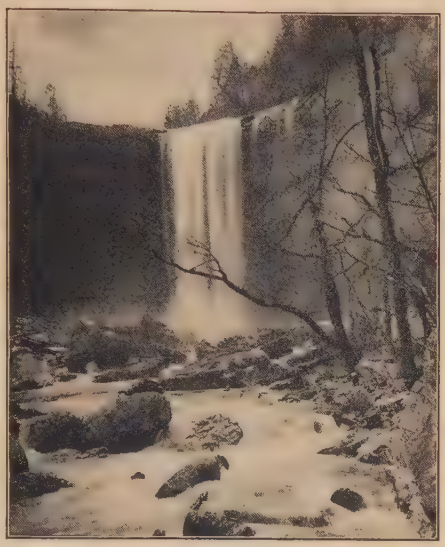
Pond made by a Glacier

that have passed since the ice melted seem like a very long period of time, it is really a very short time in comparison with the millions of years that have passed since the continent itself was formed.

In some places the ice scraped out basins in the soil or the rock, and in others it piled up drift across valleys, forming basins which were filled by valley streams.

Many rivers were turned out of their old courses and caused to flow elsewhere. This was because the old courses were filled with drift so that the water could no longer flow through them.

These changes were the cause of most of our waterfalls. As we know that our ponds and lakes are not very old, we also know that the waterfalls must have been caused by some change that took place not very long ago. The precipice over which the water flows at any waterfall is constantly worn away. After a long time it will either become a long slope in the bed of the stream or will disappear altogether. Many of the brooks and rivers that flowed across the country in new courses after the ice melted, dashed over steep slopes and precipices, and thus new waterfalls were formed.



Waterfall and Precipice

1. Why do not the hills that have been formed by the ice consist of solid rock in the center, like other hills and mountains?

2. Why is some of the soil that was produced by the Great Glacier now found in regions farther south than those that were covered with ice?

3. Why are not large rocks found in the glacial drift that was carried farther south than the ice extended?

4. What will probably become of the thousands of ponds and lakes in the northern part of the country after a very long time?

5. What will become of the waterfalls?

6. Why are there not many ponds and lakes in the southern part of the United States?

7. Why are there not many loose rocks in the soil in the southern part of the country?

THE NORTHEASTERN SECTION

7. Manufacturing

Our country is so large and its parts differ so widely from one another in respect to climate, the nature of the land, and the occupations of the people, that it is best to think of it as divided into separate sections and to study each section by itself.

We naturally begin with the Northeastern Section because that was first settled by white people. The descendants of the early settlers, although they are now scattered over all parts of the country, have a feeling of respect for old New England and the other states of the Northeast.

Portions of a number of states southwest of the New England States are similar to the latter in physical features, climate, and occupations. It is convenient to include these in our treatment of the Northeastern Section, which we may regard as consisting of the six New England States together with New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and West Virginia.

This is one of the great manufacturing regions of the world. Thickly scattered over it are towns and cities, many of whose inhabitants work in mills or factories.

From what we have learned about the Ice Sheet it is easy to understand that its effects have been one of the chief causes of so much manufacturing in a large part of this section. By changing the courses of many rivers it produced waterfalls and hence water power for the mills.

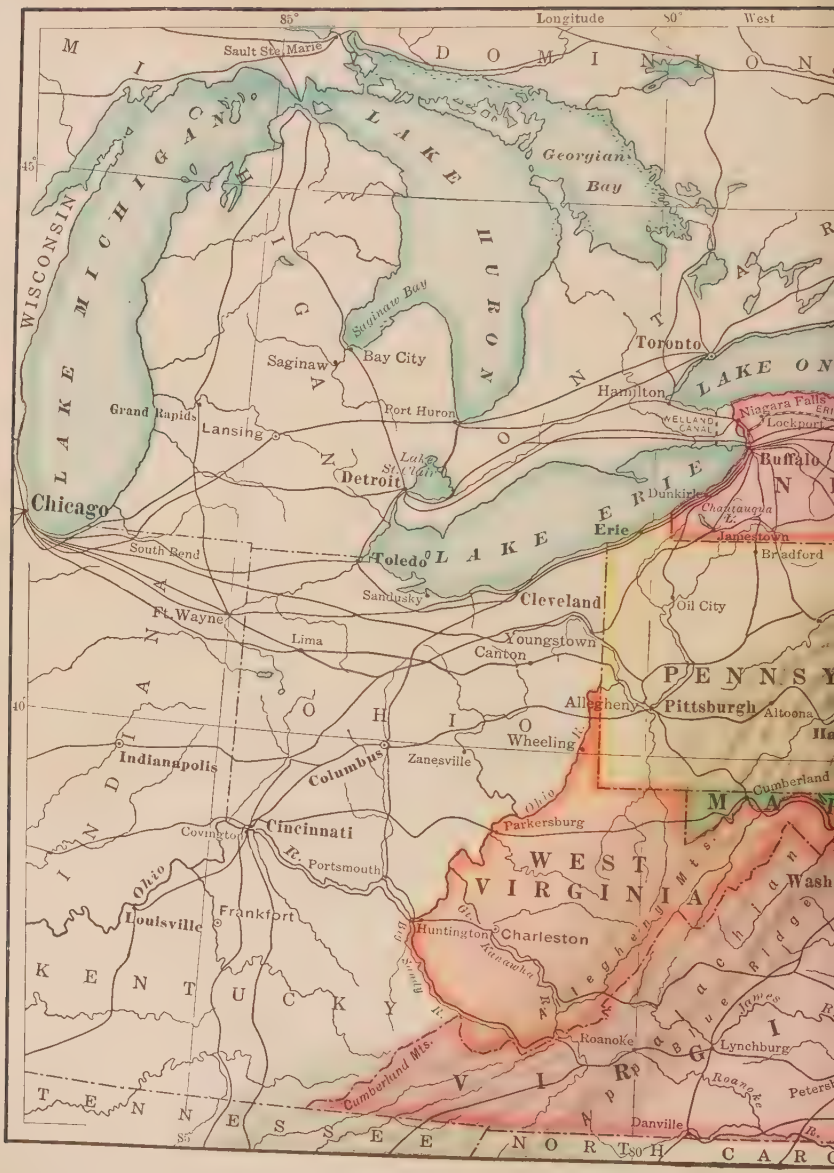
Ponds and lakes also, which were caused by the ice, are of great assistance. They serve as reservoirs to hold back a supply of water. If there were no ponds, a large part of the water from heavy rains and melting snows would run into the streams at once and flow away to the ocean. In a short time the water in the streams would be low and the water power would

Mills run by Water Power

be small. When the water runs first into ponds, it afterwards runs gradually out into the streams, and so there is a supply of water for the mills.

The amount of water held back in ponds is often increased by dams built across the outlets. The water is allowed to pass through the dams as it is needed, and keeps the mills running through periods of dry weather.

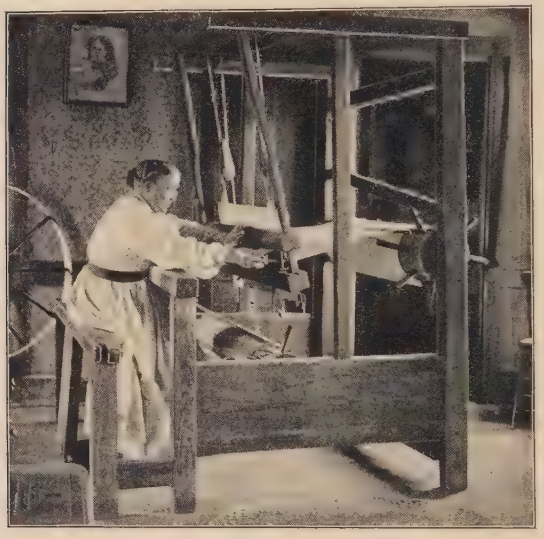
The people who settled along the shore of the country in the early times made most of the articles that they


85°
Longitude
80°
West
45°
40°
85°
80°
Sault Ste. Marie
DOMINION
LAKE HURON
Georgian Bay
LAKE MICHIGAN
WISCONSIN
Saginaw Bay
Saginaw
Bay City
Toronto
Hamilton
LAKE ONTARIO
Grand Rapids
Lansing
Fort Huron
WELLAND CANAL
Niagara Falls
Lockport
Buffalo
Lake St. Clair
Detroit
Chicago
Dunkirk
Chautauqua L.
Erie
LAKE ERIE
Jamestown
Bradford
South Bend
Toledo
Sandusky
Cleveland
Oil City
Ft. Wayne
Lima
Youngstown
Canton
PENNSY
Allegheny
Pittsburgh
Altoona
Wheeling
Zanesville
Indianapolis
Columbus
Cumberland
Ohio
Parkersburg
Covington
Cincinnati
Portsmouth
WEST VIRGINIA
Wash
Louisville
Frankfort
Huntington
Charleston
Kanawha
Big Sandy R.
KENTUCKY
Roanoke
Lynchburg
Cumberland Mts.
Roanoke
Petersb
Danville
TENNESSEE
NORTH CARO

NORTHEASTERN STATES
Capitals of Countries:
Capitals of States:
Other Cities:
Principal Railroad Lines:
0 25 50 100 150 200
Scale of Miles
THE M.-N. WORKS.
75°
70°
Greenwich
CANADA
Montreal
Ogdensburg
St. Albans
Burlington
Montpelier
Rutland
Adirondack Mountains
Lake Champlain
Lake George
Saratoga Springs
Rome
Utica
Mohawk
Little Falls
Amsterdam
Schenectady
Albany
Troy
Bennington
Concord
Bellows Falls
Keene
Nashua
Manchester
Haverhill
Lawrence
Salem
C. Ann
Gloucester
Lowell
Lynn
Cambridge
Quincy
Massachusetts Bay
Boston
C. Cod
Provincetown
Plymouth
Providence
Fall River
New Bedford
NANTUCKET
MARTHAS VINEYARD I.
Newport
BLOCK I.
Westerly
Montauk Pt.
Waltham
Worcester
Holyoke
Springfield
Woonsocket
Pawtucket
Hartford
Waterbury
Pough keepsie
Newburgh
Scranton
Wilkes Barre
Paterson
Jersey City
Newark
Reading
Trenton
Camden
Long Island Sd.
LONG IS.
Brooklyn
New York
New York Bay
Long Branch
Asbury Park
Atlantic City
Delaware Bay
Cape May
DELAWARE
Cape Charles
Cape Henry
Norfolk
Cutskill Mountains
Lake Champlain
Lake George
Rochester
Dover
Portsmouth
Biddeford
Portland
Bath
Augusta
Lewiston
Rockland
Bar Harbor
MT. DESERT I.
Auburn
Mt. Washington
White Mts.
Rutland
Waterville
Skowhegan
Bangor
Eastport
Calais
Moosehead Lake
Mt. Katahdin
Houlton
NEW BRUNSWICK
MAINE
NEW HAMPSHIRE
VERMONT
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
NEW JERSEY
PENNSYLVANIA
ATLANTIC OCEAN

needed by hand work at home. Very soon, however, they began to build small mills by the waterfalls, to grind grain and to saw lumber for buildings.

For clothing, wool or flax was raised. It was spun into yarn, and woven into cloth, by the women and girls of each household.



An Old-fashioned Loom

After a time machines were invented in England by which the yarn could be spun and cloth could be woven much more rapidly than by hand, and factories were built for this purpose in America, like those in England. Since that time many woolen mills have been built beside waterfalls, along the rivers.

Small mills for weaving cotton cloth were first built in Rhode Island. Since these were successful and cotton could be obtained from the South, many large mills have been built in different parts of New England.

The people of this section have learned, by years of experience, to manufacture various articles with skill and profit. They have continually built new mills, and manufactured vast quantities of goods.

In many places, where there is not sufficient water power, mills are run by steam power, produced by burning coal. Besides goods from cotton, wool, iron, and lumber, many other articles are manufactured in this section, such as boots and shoes, and jewelry and other articles from the different metals. It does not require

Courtesy of Regal Shoe Co.

Cutting Room in a Shoe Factory

much power for manufacturing many of these things. The work could be done as well in other parts of the country, but the people of this section are so much interested in manufacturing that they are inclined to produce articles of many different kinds.

The mills have given this section a dense population. A large mill employs hundreds of persons, and when we consider that usually only one or two persons from each family work in the mills, we can readily see that there may be families enough supported by even a single mill to make a town of considerable size.

The New England States and other states in the Northeast are small in comparison with the states of the West, but when the number of people and the amount of property that they possess are taken into account, the case is quite different. California, for example, is more than nineteen times as large as Massachusetts, but it has not nearly so many people. The little state of Rhode Island has between three hundred and four hundred people per square mile, while Nevada has less than one person for each square mile.

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Weaving Room in a Cotton Mill

The amount of goods produced in a single one of the numerous manufacturing cities of this section is surprising. The cotton mills of Fall River produce more than two miles of cloth in a minute. If all the cloth manufactured in the mills of that city in a year could be drawn out in one continuous piece, it would very nearly reach from the earth to the moon and back again.

The goods manufactured in New England are sent to all parts of the world.

1. Cotton manufacturing in this country was begun at Pawtucket in the year 1790. In what state is Pawtucket?

2. Providence contains some of the largest cotton mills in the world and manufactures much jewelry. About how far is it from Boston?

3. More cotton cloth is made in Fall River, New Bedford, Lowell, and Manchester than in any other cities of the country. Locate these cities.

4. The Merrimac turns more spindles than any other river in America. Name the cities on that river and the state in which each is situated.

5. Large quantities of hardware and firearms are manufactured at New Haven. In what part of Connecticut is it?

6. Automobiles are made at Hartford and Springfield. Locate these cities.

7. In a single factory in Waltham over two thousand watches a day are made. In what part of Massachusetts is Waltham?

8. More shoes are made in Haverhill than in any other city. In what direction is it from Boston?

9. Worcester is noted for a great variety of manufactures. In what part of Massachusetts is it?

8. Agriculture

The most important and necessary business in a great country like ours is agriculture. Although in many localities the leading occupation of the people may be manufacturing, or lumbering, or mining, the welfare of all the people of the country depends more

upon agriculture than upon any other industry. When the farmers are able to produce large crops, there is an abundant supply of materials for food and clothing for all the people and much to sell in foreign countries. Nearly one half of our entire people are engaged in agriculture, but this is not true of the people in the North-eastern Section. A large proportion of these are engaged in other occupations.

Digging Potatoes

The early settlers along the eastern coast of the country were nearly all farmers. They cut down trees, tilled the land, and raised crops to supply their families with food and clothing.

But while these people could obtain from their small farms enough for their simple wants, this part of the country was not suitable for the business of agriculture in a large way. Much of the land is very hilly and rocky and in many sections the soil contains so little plant food that it is necessary to purchase large quantities of fertilizers to enrich it.

Since the soil here was brought from various regions in the north by the Ice Sheet, it differs greatly in different

localities. Here and there finely pulverized clay and other varieties of soil are found, which make good land for farms. In other places so many large rocks were dropped by the ice that the land is nearly worthless for cultivation.

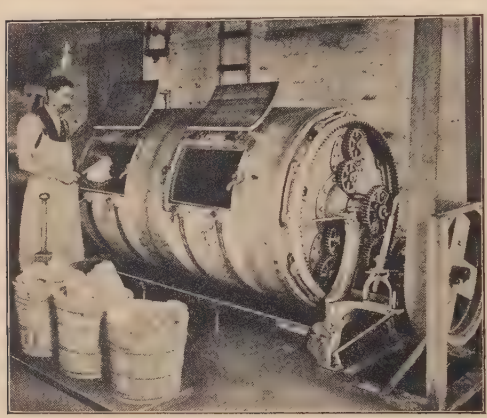
In several regions the land is good for raising special crops, and in these agriculture is a successful business.

Shipping Milk to the City

In the northern part of Maine thousands of acres of potatoes are raised every year. In the fine soil along the valley of the Connecticut River a large amount of tobacco and other crops is raised. In the states of this section to the west and southwest of New England there are larger regions of good farming land.

Dairying is an important industry in parts of New England, especially in Vermont, and in the states of New York and Pennsylvania. The rough lands afford pasture for cows in summer, and in the cultivated fields hay, corn, and other crops are raised to supply food for winter.

A large amount of milk is required to supply the numerous towns and cities. A very large quantity also is manufactured into butter and cheese. Instead of making butter or cheese at home, many farmers send milk or cream to a creamery, where it can be manufactured in large quantities with less labor. Nearly all of the cheese now produced in the United States is made in factories.



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A Great Churn

This churns 800 pounds of butter at once.

Cream is separated from milk in different ways. It is lighter than skimmed milk, and if milk is kept cold in ice water for a time, the cream rises to the top and is then removed. It is removed much more quickly by a machine called a separator. Every boy knows that if he fastens a stone to a string and whirls it about, it will pull hard upon his finger as it tends to fly away. The heavier an object is the more it will tend to pull away. When milk is whirled about very rapidly in a separator, the skimmed milk, which is heavier than cream, crowds to the outside and is there drawn off through a tube, while the cream is drawn off through another tube.

Cream consists of particles of butter fat surrounded with buttermilk. In a churn cream is stirred and

beaten about so forcibly that the particles of fat are separated from the milk and form butter.

In a cheese factory milk is carefully heated to a certain temperature, and then a liquid called rennet is stirred into it. In a short time the white substance of the milk forms a curd and this is pressed into cheese.

A Vineyard in New York

So many vegetables are needed for the numerous cities of this section that many people living near each of them are engaged in the business of truck farming. The farmers receive such good prices for fresh vegetables that they can afford to buy fertilizers enough to make the land produce good crops.

In the state of New York, along the southern shore of Lake Ontario, grapes and various other fruits are raised in great abundance. In the vicinity of Rochester there are noted nurseries which supply young trees and shrubs to the fruit regions of the state.

Large quantities of strawberries, peaches, and other fruits are produced in the states of New Jersey and Delaware.

Thousands of farmers in New England and in northern New York are able to add to their income by accommodating summer boarders who go there to rest and to escape the heat of cities farther south.

1. Why do not the farmers of the Northeastern Section raise food enough for the people of that section?

2. How can many farmers on small farms near cities make as much profit as those on larger farms farther away?

3. Why have many farming people removed from New England to the West?

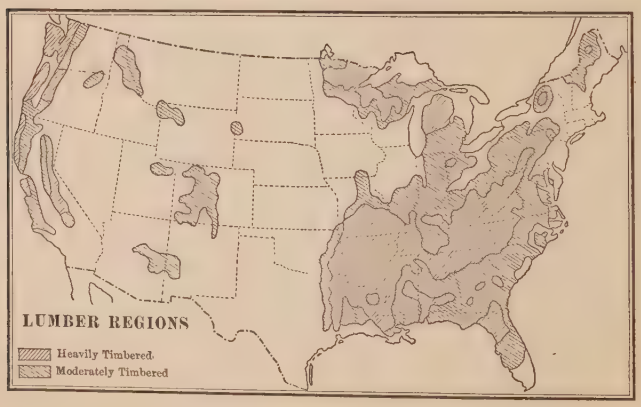
4. Why is the soil thin on most of the uplands of New England?

5. St. Albans, Vermont, is a great center for dairy products. In what part of the state is it?

6. Lancaster is in the midst of a rich farming country. In what part of Pennsylvania is it?

7. Large quantities of fruit and vegetables are canned at Baltimore and Wilmington. In what states are these cities?

8. There is much tobacco manufactured at Lynchburg and Danville, in Virginia. Locate these places.



9. Forests

The eastern part of our country was once mostly covered with forests, but now the greater part of the trees have been cleared away to make farms for the cultivation of crops and for pasturing domestic animals.

This process has continued as the people have gone farther and farther back into the woods, taking the

A Logging Camp in Maine

forests for farms, until most of the large forests have disappeared. Those that remain are chiefly in regions where the land is not desirable for farms or in districts far away from settled communities.

In the northern part of New England there are still extensive forests. There are large forests also in the region of the Adirondack Mountains in New York and along the Appalachian Mountains in the states farther south. The largest forests in the Northeast are those

in northern Maine. These once contained many tall pine trees, and Maine is still sometimes called the "Pine Tree State," but most of the pines have been cut and forests of spruce have grown in their places.

Most of the timber that is cut in these northern forests is drawn upon snow in winter to the banks of streams. In the spring, when the water runs high in the streams on account of rains and melting snow, the

A Sawmill

logs float down over the rough and rocky places into the deeper rivers, and finally to mills, where they are sawed into lumber. The most favorable locations for lumber mills are at points near waterfalls, which can be reached by vessels from the ocean. Logs can be floated to such mills, the waterfalls furnish power, and the lumber can be easily shipped away. The city of Bangor, which is a noted lumber center, has all these advantages. But the lumber from many mills is sent to market on railroads, and wherever water power cannot be obtained, the mills are run by steam power produced

by burning sawdust and refuse wood that come from the process of manufacturing.

The forests have been cut away very fast since paper began to be made from wood. Spruce and hemlock are the best kinds of wood for paper making, but other varieties also are used. A large part of the material for wrapping paper, newspapers, and books is now made from wood. The American people use so many books and read so many papers that a great amount of material is required for them. The demand has increased so fast that the forests have been cut down faster than new forests can grow, and a large amount of wood for the paper mills of the country is now imported from the forests of Canada.

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Making Paper from Wood Pulp

It is said that the paper for a single edition of the New York Sunday newspapers requires as much wood as several hundred acres of land will produce in thirty or forty years. When we consider how many newspapers are published in all the cities of the country, it is not surprising that the forests are disappearing.

It has been discovered recently that paper can be made from corn stalks, from the stalks of the cotton plant, and from some kinds of coarse grass. If this discovery is successful, it will help to save the forests.

It is most discouraging when, in the dry summer season, the air becomes filled with the smoke of great forest fires. Camp fires carelessly left in the woods often destroy thousands of acres of valuable timber. It takes as many as a hundred years for large forest trees to grow and when all the trees, both large and small, have been destroyed by fire or by the woodsman's ax, there can be no hope that other forests will soon take the places of those that are gone.

Our national government and the governments of some of the states are now striving to protect the forests by checking forest fires, by encouraging the planting of trees, and by preventing lumbermen from destroying small trees when cutting large ones.

The bark of hemlock trees and oak trees is used for tanning purposes in making leather. Much hemlock bark is obtained in the eastern part of Maine, and oak bark in the states farther south.

1. Mt. Katahdin is in the midst of extensive forests. In what part of Maine is it?

2. On what river is the city of Bangor?

3. There are paper mills at Waterville and Augusta. By what river are logs floated to these cities?

4. Large quantities of paper are made at Bellows Falls, Vermont, and at Holyoke, Massachusetts. On what river are they?

5. Williamsport, in Pennsylvania, has an extensive lumber business. In what part of the state is it?

6. Watertown, New York, has large paper mills. Near what forest region is it?

10. Fishing

Fishing has always been an important industry along our northeastern coast. There are shallow waters along the coast from Cape Cod to the island of Newfoundland. A part of this region of shallow water, near Newfoundland, is called the "Grand Banks." Here the icebergs from the north float into warmer water, and are melted,

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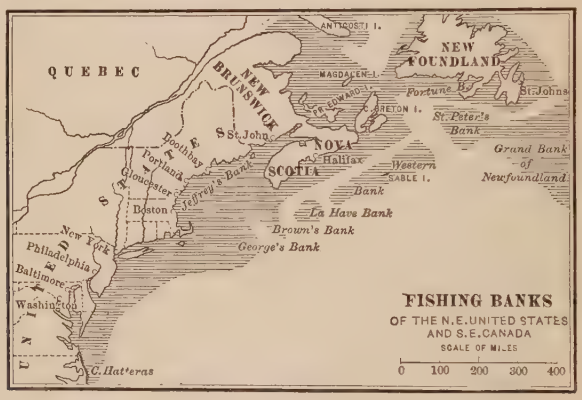
Unloading a Cargo of Fish

and the soil and rocks which they have brought from the glaciers of the north are dropped year after year, building up the bottom of the ocean.

Many fish live in these shallow waters because they find more food there than in other parts of the ocean. A part of their food consists of very small plants that float in the water. Large fishes feed also upon smaller ones. This seems like an unfortunate custom of the world of fish, but probably our supply is not greatly

reduced by it. So many millions of tiny fishes are hatched every year that if all of them should escape the jaws of their hungry neighbors, the ocean could not furnish food enough for such an immense number, and a large proportion of them would die of starvation.

In the early times there were many small villages along the Atlantic coast, and fishing, for either a part or all of the time, was the occupation of large numbers



of people. This was a good training school for sailor boys. Many young men, who became accustomed to the sea by fishing, afterwards served on larger merchant ships or ships of war.

Fish were formerly found in great abundance near the shore, and fishermen went out in small boats to catch them, but now it is necessary to go farther from the shore and in larger vessels.

The lives of fishermen are full of hardship and danger. In their small vessels they are exposed to many violent storms. In the dense fog, which is very com-

mon on the Grand Banks, their boats are liable to strike against icebergs or abandoned wrecks, or to be sunk by large ocean steamers which pass across the "Banks" on their way to Europe. For many years there has been an average of more than a hundred fishermen lost

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Drying Fish at Gloucester, Mass.

annually from the boats which have gone out from the single city of Gloucester, Massachusetts.

But the business is profitable, and thousands are willing to risk its dangers. The fishermen of New England bring in about ten million dollars worth of fish every year. Several hundred fishing vessels go out from Gloucester. Many of these go to the Grand Banks and some of them even to Greenland and Iceland.

Boston is one of the greatest fish markets in the

world. Over one hundred million pounds of fish have been brought into Boston in a single year.

Codfish are caught with baited hooks on lines. On the fishing ground a long rope, called a trawl, is fastened to floats, and hundreds of hooks are attached to the trawl. Men go out from the larger vessels in small dories and gather in the fish and bait the hooks. This work is especially dangerous. The small boats are liable to be caught in a fog and lose their way, or to be sunk in a storm.

Some codfish are sold while fresh, but most of them are split, cleaned, soaked in brine, and dried. After they are cured in this way they may be kept for a long time and sent to distant markets.

Halibut are also caught with lines. These fish are very large. Some of them weigh several hundred pounds each.

Some smaller fish, like mackerel, swim together in large schools. When a school of mackerel is swimming near the surface, a net is drawn around the fish as they are crowded together in the water and large numbers are gathered in.

Shad swim up the rivers from the ocean, and many are caught in the rivers that flow into Chesapeake Bay, as well as in those farther north.

Trout in the mountain streams, and perch, pickerel, bass, and other fish in ponds and lakes, provide much sport; but these fish are generally small and do not contribute greatly to our supply of food.

Lobsters are caught along the coast. They are especially abundant on the coast of Maine. Traps con-

taining bait are lowered to the bottom and lobsters crawl into these in search of food.

Clams and oysters also furnish considerable food from the sea. Clams live in the mud near the shore, and are dug when the tide is low. When oysters are young, they are very small, active animals, far different from the form in which we see them, and swim about in the water. After a time they go to the bottom, fasten themselves to bits of rock or other objects, form shells about themselves, and remain in the same positions through their lives. They are found in the quiet waters of some of the bays along the shore south of Cape Cod, but are most abundant in Chesapeake Bay.

Dredging for Oysters in Chesapeake Bay

1. Find about how far fishing vessels sail in going from Gloucester to the Grand Banks.
2. Give reasons why Boston is naturally a large market for fish.
3. Baltimore and Norfolk are noted for canning oysters. Why are so many canned at these places?
4. Why are fishermen forbidden to catch and sell young lobsters?
5. Name as many kinds of salt-water fish as you can.
6. Name as many kinds of fresh-water fish as you can.
7. Draw a line representing the coast line of the northeastern part of the country and locate Portland, Gloucester, Boston, Providence, Norfolk, and Baltimore.

11. Building Stones

The solid rock, which is everywhere to be found beneath the soil of the land and under the mud at the bottom of the ocean, has an interesting history. Most of the rock near the surface is in layers and most of these layers have been formed from sand and mud.

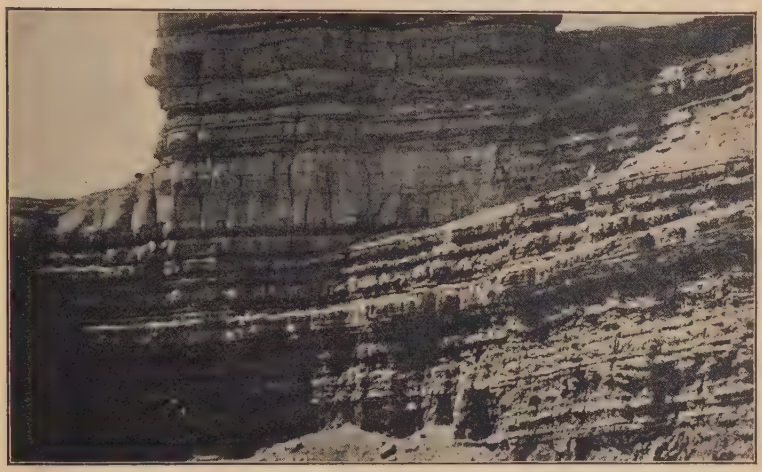
The rivers are continually carrying mud into the ocean, where it is spread out over the ocean bottom. In a very long time the particles of this mud become cemented together and the whole mass changes to stone. During the millions of years since the crust of the earth was formed, with the ocean waters upon it, one layer of stone after another has thus been made.

Stone that has been formed from a layer of sand under the water is called sandstone. Slate rock has been formed from mud composed of finer particles than those of sandstone.

Limestone contains the shells, or skeletons, of tiny animals that have lived in the ocean. Millions of these live near the surface of the water and when they die, their bodies, which contain lime, sink into the mud at the bottom. Such a layer of mud, when it hardens, becomes limestone.

By the slow movements which have taken place in the crust of the earth, portions of the bottom of the ocean have been brought above the surface of the water. In the rock at the tops of mountains fossils are sometimes found showing the prints of seashells. This indicates that even the tops of the mountains were once at the bottom of the ocean.

Rock that was formed in layers, or strata, is called stratified rock. Deep below the stratified rock, and sometimes appearing at the surface, there are other kinds called crystalline rock. When melted sugar is slowly cooled, it forms crystals, as in making rock candy. Some of the hot, melted matter beneath the outer crust of the earth, by slow cooling, has formed crystals of rock. Granite has been formed in this way. The rock that



Stratified Rock

is formed by the cooling of lava that comes from volcanoes is another kind of crystalline rock.

A small amount of the rock of the earth's crust is used by man for various purposes. It is obtained in the most convenient places, and these are called quarries.

When mountains were formed by the wrinkling of the earth's surface, the granite, which was under the stratified rock, was raised beneath the strata and formed the lower central part of the mountains. In places

where the old Appalachian Mountains have been mostly worn away, the granite has been uncovered. In the case of some very old mountains almost everything except the granite has been worn away. Mt. Washington and Mt. Katahdin are almost wholly granite.

It costs so much to carry heavy rock long distances on land that it is usually quarried only when it is found

A Granite Quarry

near cities, or near the water where it can be loaded upon vessels. A large amount of granite is shipped from the coast of Maine and Massachusetts to cities that can be reached by vessels. It is used for buildings, paving stones, and other purposes.

Marble is much softer than granite and can be sawed into pieces of regular sizes. It is used for buildings, monuments, and statues. It is more scarce and valu-

able than granite and is often shipped long distances on railroads. The most noted marble quarries are near Rutland, Vermont. Most marble is nearly white, but that of the Rutland quarries is streaked with blue.

Slate rock is valuable because it is composed of thin layers with smooth surfaces. It is used largely to cover the roofs of houses. Slate is found in various parts of the New England States and in Pennsylvania.

Marble Quarry at Rutland, Vermont

Limestone is valuable in constructing buildings. It is used also in blast furnaces for smelting iron ore. Quicklime is produced by heating pieces of limestone in limekilns. Every one has seen masons preparing plaster for building walls or chimneys or plastering houses. They pour water upon pieces of lime. Very soon the water disappears and the lime becomes hot and crumbles. Lime has a strong attraction for moisture. The heat of a limekiln drives off the moisture; but when water is

thrown upon quicklime, particles of lime seize upon particles of water and hold them in a solid form. It is the process by which particles of water and lime are united that causes so much heat.

Sandstone is often used for foundation walls and other parts of buildings.

1. Footprints of animals are sometimes found on layers of stone deep below the surface of the land. What does this show?

2. How do we know that mountains that have a surface of granite are very old?

3. Why is not granite quarried at Mt. Washington?

4. Why is New Hampshire called the Granite State?

5. The Quincy granite quarry is not far from Boston and not far from the coast. Why are both of these facts of great advantage?

6. There are granite quarries at Concord, New Hampshire, Gloucester, Massachusetts, and Westerly, Rhode Island. Locate these places.

7. How do we know that the beds of marble were once at the bottom of the sea?

8. There are valuable limestone beds at Rockland, Maine. Locate that city.

Map showing Coal Areas

12. Coal

The most important of all the minerals that are taken from mines is coal. The coal mines of our country are its storehouses of heat and power. Coal furnishes steam power for mills and workshops, for railroad locomotives, and for steamboats. It supplies heat for cooking food and for comfort in millions of households.

Vegetation of the Age when the Making of Coal Began

Man lived on the earth for thousands of years without knowing that coal could be burned. If its usefulness had never been discovered, how different would the progress of the world have been! For some purposes wood might have been used instead of coal, but only with great inconvenience. Think of an express train stopping here and there to take on a supply of wood for the engine. Think of a steamship taking on wood enough to drive it across the ocean. It would require

so much space that there would be no room for cargo or passengers. Besides such difficulties, if we depended upon wood for heat, all the trees of the world would soon be consumed, and then mankind would be in a sad plight.

Man could never have reached his present stage of civilization without coal. How fortunate it was that millions

Mammoth Vein of Coal One Mile under Ground

of years ago, before man appeared upon the earth, this substance was stored away for his needs.

Coal was formed in what is called the Carboniferous Age of the earth. At a time when portions of North America sometimes rose above the surface of the ocean and sometimes sank again below the waters, and layers of rock were formed, layers of coal were formed in some regions between the layers of rock.

In moist regions trees and other plants grew and fell. The accumulation of many years produced a layer of vegetable matter similar to the layers of muck or peat which are now to be found in swampy places. When

the land sank and water washed over it, this layer of vegetable matter was covered with a layer of mud, which was afterwards changed to stone. As such changes continued for millions of years, several layers of stone were formed, one upon another, with now and then a layer of vegetable matter. As the vegetable

Train coming from Bituminous Coal Mine

matter was crowded down by the weight of the rock formed above it, it was slowly changed to coal.

In some places the layers of stone and coal have been so tilted by movements of the earth's crust that layers of coal appear at the surface, but it is usually necessary to find them by sinking shafts through layers of rock.

A large part of the coal found in the country is soft, or bituminous coal. In the northeastern part of Pennsylvania, in the region of the old Appalachian Mountains, a different kind is obtained, which is called hard, or anthracite. In this region where mountains were formed by folds in the earth's crust there was an unusual amount of pressure and the coal became very hard.

Anthracite is much more desirable than bituminous coal for some purposes, and since it is found chiefly in this one region in Pennsylvania, it is shipped to various parts of the country.

More coal is now produced in the United States than in any other country of the world. There are layers of coal beneath more than one sixth of the entire surface of the country.

Coal as seen through a Microscope

1. Name the states through which the eastern or Appalachian coal fields extend. (See map on page 56.)

2. In what two other states east of the Mississippi River are there large coal fields?

3. What three states west of the Mississippi have large beds of coal?

4. Name ten other states in which there are smaller coal fields.

5. A very large amount of coal is obtained near Pittsburg. In what part of Pennsylvania is this city?

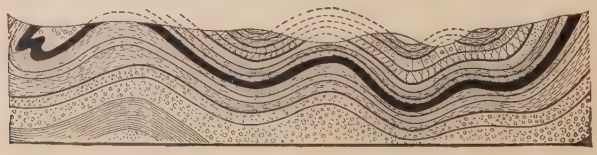
6. There are beds of anthracite coal near Wilkesbarre and Scranton. In what part of the state are they?

7. Why is the price of coal low in such regions as Pennsylvania and West Virginia?

8. Why do the people in the northern part of Maine, Michigan, and certain other states, burn wood for fuel, although coal may be more desirable?

9. Does coal probably cost more in Boston or in Philadelphia?

10. Make a map of the state of Pennsylvania, locating the mountains, the largest rivers, and the cities that are important coal centers.

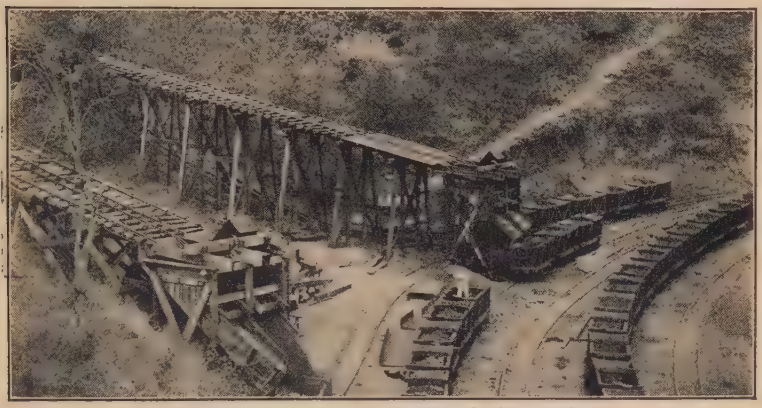


Section of Earth's Crust showing Layers of Coal

13. Iron

The second important substance obtained from mines is iron, the most useful of the metals. Iron is so common and cheap that we may think but little of it; but we use so much that the amount obtained from the mines is worth far more than the gold from our gold mines.

What should we do without iron and steel for engines, boilers, and machines in our factories, for locomotives and rails for our railroads, for bridges, for the frames



Loading Ore at a Pennsylvania Iron Mine

of great buildings in our cities, for stoves and furnaces in our homes, and for hundreds of other things?

Iron is so valuable to mankind that even uncivilized people have learned to use it. Many barbarous tribes in Africa, before they had seen a white man, obtained iron by melting iron ore and with it made spear heads and ornaments.

There are small quantities of iron in many of the rocks and in the soil. Iron in the soil often gives it a

reddish or a brown color. As water passes slowly through soil or porous rocks that contain iron, it dissolves a little of the metal and carries it away. In certain places to which dissolved iron is thus carried, it separates from the water again and in a long period of time a large amount accumulates.

Sometimes iron is found deep in the earth, in places to which water has carried it and where it has filled

Coke Ovens

spaces between rocks, and sometimes in beds near the surface, where it has settled from standing water.

In the form in which it is first found it is not pure iron but iron ore, or iron combined with other substances. It must be separated from these substances before it can be used. This is done by mixing iron ore with limestone and heating it very hot in blast furnaces, a process that is called smelting.

For smelting ore, coke is used instead of coal because it produces greater heat. Coke is prepared from coal. Large coke ovens, called "beehive ovens," are filled with coal and a fire is started. After the coal has become

very hot the draughts are closed. This prevents the coal from being consumed and converted into ashes, because air is necessary if anything is to burn, but the great heat drives off certain other substances, leaving coke, which is the part of coal that will produce the hottest fire.

One substance driven away from coal in coke ovens is common illuminating gas, such as is used in city

A Bessemer Converter making Iron into Steel

houses. At city gas works this gas is obtained by heating coal, and the coke, which is not needed at the gas works, is sold for other purposes.

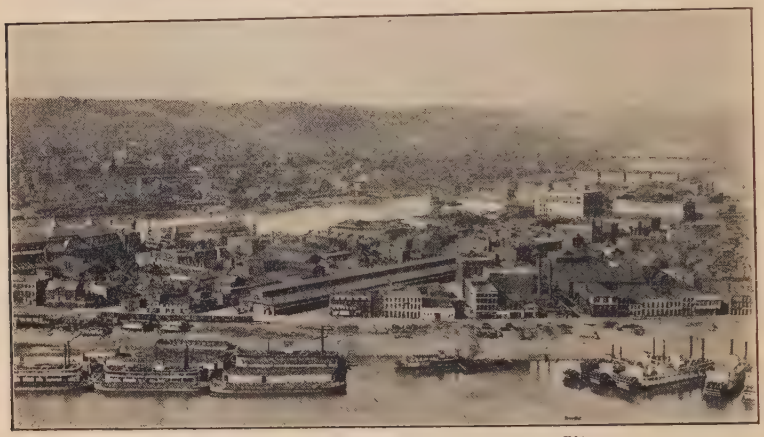
Common iron, or pig iron, is used for many purposes, though it contains impurities. It may be rendered harder and stronger by processes that change it into steel. One process consists in burning some of the impurities by forcing blasts of air through melted iron.

Steel must be used, instead of iron, for rails on rail-

roads, for bridges and the framework of buildings where great strength is needed, for tools with sharp edges, and for many other purposes.

By certain other means iron and steel are made soft and flexible for such articles as wire and nails.

In Pennsylvania and West Virginia there are mines of iron ore, and the coal and limestone necessary for smelting it are found in abundance. The production of



Panorama of Pittsburg and Allegheny City

iron and steel and the manufacture of various articles from these is a leading industry of that region. In the states near by, to which iron can be sent without great expense, much iron and steel work is carried on.

The city of Pittsburg is a great center of the iron and steel industry. Its products are sent to the most remote countries of the world. It has furnished locomotives for the Siberian railroad, bridges for the rivers of Asia and Africa, and armor plate for the battleships of many countries.

1. Why is iron of greater importance to the world than gold?

2. Name some improvements that could not have been made so easily if no iron had been found in the earth.

3. Name a number of articles that are made of iron.

4. Name as many articles as you can that are made of steel.

5. Why are many steel ships made in Philadelphia?

6. Much iron is manufactured in New York City. Is this city nearer the iron mines than Philadelphia or farther from them?

7. At Wilmington, Delaware, many cars and steel ships are made. In what part of the state is that city?

8. A large amount of iron is manufactured at Wheeling, in West Virginia, and at Roanoke, in Virginia. Locate these places.

9. Many stoves are made at Albany and Troy. By what river may iron be shipped to these cities?

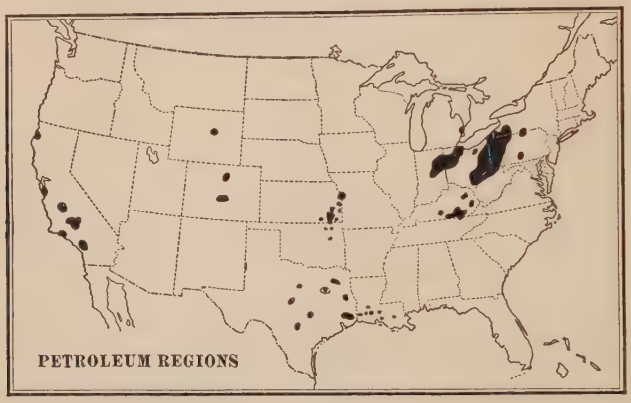
In the Oil Region

14. Oil, Gas, and Salt

Other useful substances besides coal and iron are found in the earth in the northeastern part of the country. At a time when this region was beneath the ocean, large numbers of animals and plants died and sank into the mud at the bottom. As they slowly decayed oil and gas were formed. When the whole mass was

changed to stone, the oil and the gas were held in the pores of the stone. A similar kind of oil is now obtained from fish, and we know that similar gases are produced when plants decay.

In places along the western border of the Appalachian Mountains oil is obtained by drilling wells deep



into the rock. It is found in great abundance in the northwestern part of Pennsylvania and the southwestern part of New York. There are valuable oil regions in Texas and California, as well as in various other parts of the country.

In the oil regions there are many tall frames or derricks for drilling the wells. There are also immense tanks in which oil is stored.

Sometimes the oil that is reached by drilling a well is under such pressure in the rocks that it will rise to the surface and flow away without pumping. Sometimes the pressure is so great at first that the oil will spurt high into the air. At most of the wells, however, it is pumped with steam pumps.

This oil is called petroleum, which means rock oil. It is also sometimes called coal oil. As it first comes from the earth it has a dark yellow or reddish color. Before it is suitable for use it must be purified, or refined. The refineries at which this work is done are mostly situated at seaports or lake ports from which the oil may be shipped on vessels.

Gushing Oil Well

Petroleum from the wells in different parts of the country is conveyed to the refineries in a peculiar manner. It is not usually carried on railroads, but is pumped through large pipes. We know how water for the supply of a city is pumped through a pipe into a reservoir. In a similar way petroleum is pumped through hundreds of miles of pipe. There is a pipe line that extends from the state of Kansas to Chicago and thence to the Atlantic coast, a distance of seventeen hundred miles. The pipe is generally buried in the ground and beneath the beds of rivers. Steam pumps located here and there along the way pump the petroleum from one point to another till it reaches its destination.

By the process of refining petroleum a great number of useful substances are obtained, such as gasoline, benzine, and vaseline. It is said that there are more than two hundred of these products, but by far the most useful is kerosene.

The discovery of petroleum and of the method of producing kerosene was of great benefit to mankind. Before that time people depended upon candles and lamps without chimneys. These lamps smoked and gave only a dim light.

Oil from the refineries of the United States is not only used in all parts of our own country, but is carried to

A Whaleback Oil Steamer

the most remote parts of the world. It is sent on railroads to the various cities of the country by tank cars.

It is carried to foreign countries in steamers built for the purpose, which are really floating tanks. At the refineries kerosene is pumped into the steamers and at foreign ports it is pumped out and distributed.

There is scarcely any part of the world in which travelers do not see American oil. It is carried on the backs of camels across the deserts of Africa, on wheelbarrows through the streets of the cities of China, and on sledges over the snows of the frozen north.

Natural gas also is obtained by drilling deep holes

into the rock. When a reservoir of gas is reached, the gas rushes out, and continues to do so for a very long time. Through pipes it is conducted into houses and factories. Some towns and cities are entirely supplied with natural gas instead of that produced from coal at

Syracuse Salt Works

gas works. In Pittsburg natural gas is used in furnaces for making glass and for other purposes.

Beds of salt are found in some places buried beneath the surface of the ground. These are probably the beds of ancient salt lakes which dried up and were afterwards buried. There are a few lakes at the present time which contain so much salt that some is deposited in crystals along the shores or at the bottom.

Not only common salt but other salts also are found in beds of this kind in the state of New York. In some places large shafts are sunk and the salt is broken in pieces and brought up, as coal is obtained from a mine. Sometimes only a small hole is drilled. Water is then poured down, and after it has dissolved as much salt as

possible, the brine is pumped up and the water is evaporated until only the salt remains.

1. The cities of Bradford and Oil City are near the oil wells of Pennsylvania. In what part of the state are they?
2. Why do most of the pipe lines lead to the seacoast?
3. Why are some pipe lines built to cities on the Great Lakes?
4. Natural gas is used at Wheeling. Locate that city.
5. There are important salt and soda works at Syracuse. In what part of New York is it?
6. Salt is obtained also near Rochester. In what direction from Syracuse is it?
7. Make a map of the states of New York, New Jersey, Pennsylvania, and Delaware, showing the mountains, the largest rivers, and the cities that have been mentioned.

15. The Ocean

In studying geography we give our attention chiefly to the bodies of land because these are the homes of man. We are interested in the ocean because we may pass over it in ships to other countries and because it yields us fish and other useful products. Aside from these facts the ocean is to us a vast expanse of water remaining ever the same, except that the waves upon its surface rise in time of storm and settle in calm weather. Along the shore, however, where the ocean meets the land, its waves produce important effects.

Waves are caused by wind. The air moving over the water and pressing against it forces it up into ridges. These ridges immediately fall again and by the downward pressure crowd up other water in front. This process keeps the form of the wave continuous, although the water in the wave is perpetually changing. Along the shore where the water is shallow the body of water

in a wave can no longer make room for itself by falling, but is driven up for some distance upon the land.

The larger a body of water is, the higher the waves, because there is a longer time for the wind to blow against them and heap them up before they reach the shore. The largest waves are, of course, upon the ocean. Storm waves there are sometimes fifty feet high.

"Combing" Waves

As waves run up the shore and fall back again they move to and fro the small stones, which they slowly grind into sand or mud. In times of severe winds huge waves strike violently against cliffs along the shore and slowly wear these away also.

Much of the sand or mud thus produced is spread over the ocean bottom, but in some places it remains upon the shore and makes sandy beaches.

Those who live near the seashore are aware that the ocean does not remain at the same level, but that it slowly rises for a time and then settles again. This is due to the coming and going of the tidal wave, or the tide.

The tidal wave is thousands of miles wide, but while passing across the ocean it is not more than one or two feet high. It is caused chiefly by the moon, which is constantly attracting, or pulling, the earth.

The Waves break the Rocks and make Sand

By a force called gravity, every object in the universe attracts every other object toward itself. Objects fall upon the ground because the earth attracts them. By this force the moon attracts the water on the side of the earth that is turned toward it, and for other reasons, strange as it may seem, there is a similar wave on the opposite side.

As the earth rotates once in twenty-four hours, causing the moon to seem to revolve around the earth in the opposite direction, these tidal waves follow the moon and both of them pass every point on the ocean once in about twenty-four hours. As the wave approaches the shore the water gradually rises, and as it passes away the water gradually falls. When the water is rising, we have flood tide and when it is falling, we have

ebb tide. The tide rises for about six hours and then falls for about the same time.

Although the moon is very much smaller than the sun, it pulls upon the earth and raises the water more than the sun does, because it is so much nearer the earth. The attraction of the sun has a little effect of the same kind as that of the moon. When the moon and the sun are on the same side of the earth or on opposite sides of it, they act together in drawing out the water upon the earth, and the tide is higher than usual.

High Tide — River flowing East.

Low Tide — River flowing West

Reversing Falls, St. John, N.B.

On an unbroken coast exposed to the open sea the rise or fall of the tide is comparatively slight. Where the tidal wave passes into a bay or the mouth of a river, and the space between the opposite shores becomes narrower as

the wave advances, the water, having less space to spread out, rises higher and higher. In parts of the Bay of Fundy, in the time between low tide and high tide, the water often rises from fifty to seventy feet.

Some rivers in their lower courses are nearly as low as the ocean, and the rise and fall of the tide affects them for some distance above their mouths.

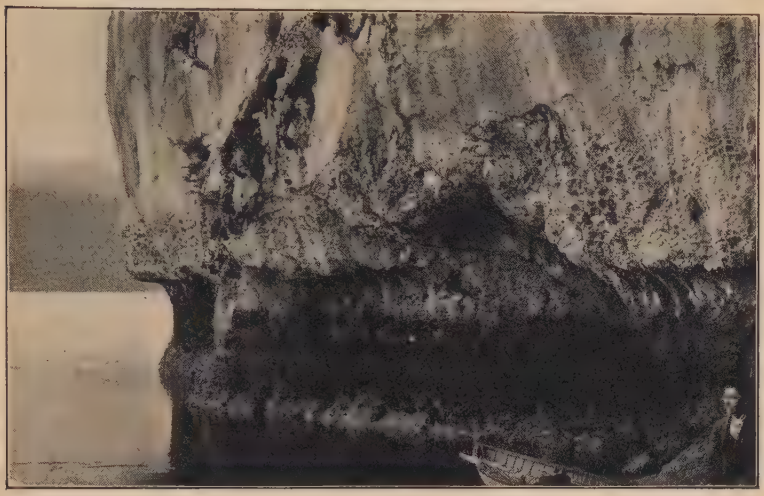
The condition of the tide is a matter of much importance to sailors. Large ships must often wait for high tide before sailing up a river or before returning to the sea.

1. Are waves higher when the wind is blowing toward the coast or when it is blowing away from the coast?
2. Why are pebbles found upon the shore usually very smooth?
3. Why are sandy beaches usually found in bays rather than on coasts which extend out into the sea?
4. Why do many cliffs that are worn by waves appear rough and uneven in places?
5. The time after high tide before high tide occurs again is about 12 hours, 26 minutes. If it is high tide to-day at 12 o'clock, at what time will it be high tide to-morrow?
6. How long is it from high tide to low tide?
7. In some places mills are run by water wheels which are turned by the tide. Would such a water wheel turn always in the same direction?
8. Copy the diagram, showing how tides are caused by the moon.

16. The Atlantic Coast

The form of the coast along the northeastern part of the United States affords good illustrations of the changes brought about by waves and other causes. The wearing effects of waves are to be seen everywhere. Here and there are pleasant bays with sandy beaches, and reaching out into the ocean are many cliffs worn into rough and jagged forms by the dashing of storm waves.

Notice, by the map, how the eastern part of Massachusetts has been washed away and carried to the north and south. This land is not solid rock, but a part of the sandy moraine of the great glacier. On that account it has been the more easily carried away: Notice also that the islands of Marthas Vineyard and Nan-



Cliff showing that the Land has Risen

The notch marking the upper line of the undermining of the waters is now three feet above the water line.

tucket have a smooth coast line on the sides that are exposed to the ocean, while the coast line on the opposite side is very irregular.

The principal cause of the uneven coast is the fact that the land has been slowly sinking. The slow movements of the crust of the earth have not entirely ceased. It is known that along some coasts the land is higher than it was many years ago and that the ocean does not flow over it so far as formerly. This is true along

the shores of Hudson Bay. But farther south our northeastern coast has settled and some of the land has sunk below the water. It has been observed that the coast of New Jersey is sinking at the rate of about two feet in a century.

Before this sinking took place, the land near the coast of New England contained many hills and valleys. As it gradually sank, the water flowed into the valleys, and the hills became either capes extending out into the water or islands entirely surrounded. The vast number of islands along the coast of Maine were once a part of the hilly mainland.

The sinking of the New England coast has been of great benefit to the people. The bays, some of which extend far inland, provide safe harbors and make it possible for vessels to go into the country. This settling of the land has in many cases lowered the river beds below the level of the sea, and hence has made such rivers deeper and wider for long distances inland. In some instances rivers have been changed to broad bays. Such river valleys are called drowned valleys or estuaries.

Narragansett Bay, the Hudson River, and Chesapeake Bay are special instances of drowned valleys.

1. Which one of the New England States has no seacoast?
2. Which one has but eighteen miles of seacoast?
3. What part of an inch a year does a coast settle if it settles two feet in a century?
4. Are there more islands and capes along a coast that has been sinking or along a coast that has been rising?
5. Why are there usually good harbors along a coast that has been sinking?
6. Why was the form of the New England coast favorable for the first settlers?

7. How has the sinking of the Hudson River valley been a benefit to New York City?

8. What cities are near the heads of Narragansett Bay and Chesapeake Bay?

9. Draw a line representing the coast line of the Northeastern Section and locate the cities that have good harbors.

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The Hudson River North of West Point

17. Cities

In this Northeastern Section there is a greater number of cities and large towns in proportion to the area than in any other part of the country. It would not be profitable to us to try to remember many facts about them all. Cities resemble one another in many respects. They have many streets where people live, and other business streets on which crowds pass to and fro to the shops and offices that are necessary for supplying the wants of all. In nearly all cities there is some manufacturing, and commerce is carried on either by railroads or by water.

Most of the cities of this section are manufacturing centers because of the great amount of water power and

the abundant supply of coal. Many may also be called distributing centers, because they send to all parts of the country and to various countries of the world manufactured articles or the agricultural products of the West. We are specially interested in those cities that excel others in some respects or that are noted for particular industries.

New York is both the greatest manufacturing city and the greatest distributing, or commercial, city in the country. This is largely because it has a convenient location for carrying on trade both with foreign countries and with the interior of our own country. It has an excellent harbor and long lines of docks for the accommodation of ships. It can send goods to the West more easily and cheaply than many other cities can.

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Wall Street and Trinity Church, New York

The necessity of building railroads to the West from Atlantic ports across the elevated regions of the Appalachian Mountains has been a serious difficulty. It costs much more to draw heavy trains up an ascending grade than along a level route. The lowest pass for a railroad across the Eastern Highlands is by the valley of the Mohawk River,

which flows into the Hudson. The New York Central Railroad has four parallel tracks running through this valley and connecting with New York City. The Erie Canal runs through the same valley, and by the waterway of this canal and the Hudson River and by railway accommodations vast quantities of goods are

The Mohawk Valley

Showing the New York Central Railroad, the West Shore Railroad, and the Erie Canal.

moved to and from the great city. More than one half of the foreign commerce of the country is carried on through this port.

New York is, next to London, the largest city in the world. The increase of population is so rapid that we can hardly comprehend it. Every year immigrants from Europe and Asia, sufficient to populate a city of good size, enter New York and remain there. Think how many new dwelling houses, school buildings, and other accommodations it is necessary to provide for such an increase. To enable the throngs of people to go from their homes to their places of business there are not only trolley lines through the streets, great bridges

over the rivers, and ferries across the rivers, but railroads elevated above the streets, in subways under the streets, and through tunnels under the rivers.

Boston is the largest and wealthiest city of New England. It has a fine harbor and is next to New York the most important seaport on the Atlantic coast.

Boston Common, looking toward the State House

It is a natural distributing center for the manufactured goods of New England as well as for some of the farm products of the interior of the country.

The people of Boston are noted for their education and refinement. The city is of great historic interest. Everybody knows the story of the Boston Tea Party, of Paul Revere's Ride, and of the Battle of Bunker Hill.

Next after New York, Philadelphia is the greatest manufacturing city in the country. It has water power from the Schuylkill River and plenty of cheap coal from the mines of Pennsylvania. More than five thousand persons are employed in its carpet factories. It has

sugar refineries, locomotive works, and shipyards. Some of the largest ships of our navy are built there. It is at the head of the tide waters of Delaware Bay and can be reached by ocean vessels. Railroads extend from Philadelphia to the West through the lowest passes in the mountains.

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Philadelphia, showing City Hall and Office Buildings

Philadelphia was founded by a company of Quakers led by William Penn. It is often called the "City of Brotherly Love." Among its interesting buildings are Independence Hall and Carpenter's Hall, which are connected with the early history of the country.

Baltimore is near the head of Chesapeake Bay and is connected with the interior of the country by railroads through the water gap of the Potomac River. It is therefore an important shipping port.

The city of Washington, the capital city of the United States in the District of Columbia, is regarded as one of the finest capital cities of the world. It has become a

large city, not because of manufacturing and commerce, but because thousands of people must live there to attend to the public business of our country.

The streets of many eastern cities are irregular, narrow, and inconvenient, but Washington was planned from the beginning for a national capital and has long and broad streets and many beautiful parks.

The Congressional Library

Visitors to the capital city are interested in the public buildings. The Capitol building, near the center of the city, is one of the largest government buildings in the world. The Congressional Library is regarded by many as the most beautiful building in the country. Among other noted buildings are the Patent Office, the Treasury Building, and the White House, which is the home of the President.

1. Name the capital city of each of the New England States.
2. Name the largest city of each of the New England States.
3. Name the capital city of each of the other states of the Northeastern Section.
4. Name the largest city of each of these states.

5. Name three cities on the Kennebec River.
6. Name five cities on the Merrimac River.
7. Name three cities on the Connecticut River.
8. Name three cities on the Hudson River.
9. About how far is it from Boston to New York?
10. About how far is it from New York, through Philadelphia and Baltimore, to Washington?
11. Make a map of the Northeastern Section and locate all the cities that have been mentioned.

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Baltimore from Federal Hill

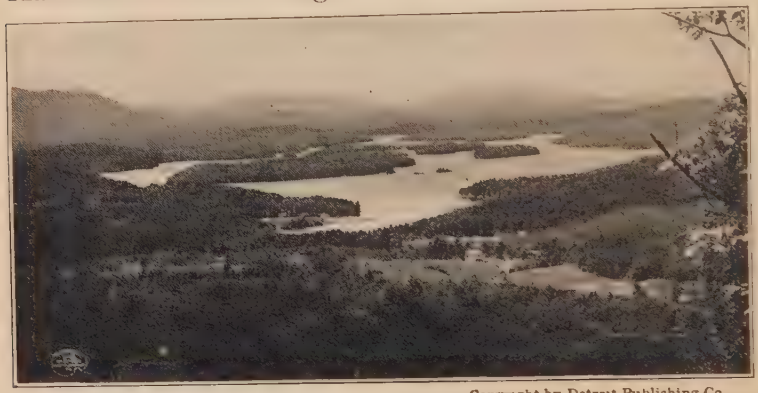
18. Interesting Localities

There are many points of interest in this section outside the busy cities. Thousands of people leave the cities every summer and go into the country, to the mountains, or to the seashore. Thousands also from other parts of the country spend their summers in the East, where they can enjoy a cool climate and interesting scenery.

Many a farmer in this region depends upon summer boarders for a large part of his income. Summer hotels and boarding houses, in ever increasing numbers, are opened in the early summer and closed again as the coolness of autumn comes on. The population of many

localities is more than doubled during the summer months. It is estimated that as much as five million dollars is left in the state of New Hampshire every year by summer visitors.

Northern New England is dotted over with lakes which were produced by the Ice Sheet. In the state of Maine there are over eighteen hundred ponds and lakes.



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In the Adirondack Mountains

The surface of these, together with that of all the rivers, amounts to about one tenth of the entire area of the state. Most of these bodies of water are among wooded hills, which afford beautiful locations for summer homes. To the forest regions of the northern half of Maine many go to enjoy camp life and hunting and fishing. The region of Moosehead Lake and that of the Rangeley Lakes are popular resorts.

Those who enjoy mountain scenery may go to the White Mountains, the Green Mountains, the Catskills, or the Adirondacks. At some points the White Mountains rise to a height of over a mile above the level of the

sea. Since the temperature is about one degree lower for each three hundred feet above sea level, it is always cool on such mountains, even in the hottest weather.

The coast line of Maine, with its numerous islands, varied scenery, and cool sea breezes, attracts many summer visitors. One of the most favored island resorts is Bar Harbor on Mt. Desert Island.

Bathing Beach at Asbury Park

Farther south, although the climate inland is often very warm in summer, the coast is cool and comfortable. At some points on the shore and on islands away from the shore people enough assemble in the summer months to make cities of cottages and hotels.

The greater part of the New Jersey coast is a continuous sandy beach. It is so near a number of large cities that it affords convenient summer homes for many thousands of people. Long Branch, Asbury Park, Atlantic City, and Cape May are popular summer resorts on this coast.

Along the shore the wind may be warm at times,

when it is blowing from the land, but on such islands as Marthas Vineyard, Nantucket, and Block Island there is a cooling effect from the water on all sides.

Newport, at the entrance to Narragansett Bay, is the most fashionable shore resort in the country.

Niagara Falls

Other interesting points in the state of New York are Saratoga, noted for its wonderful springs with medicinal properties, and Niagara Falls, which is one of the grandest waterfalls in the world.

1. Why is New Hampshire sometimes called the "Switzerland of America"?

2. Why is it generally cooler in summer at the seashore than at a distance from the shore?

3. At the rate of a fall of one degree of temperature for three hundred feet of elevation, how much cooler would it be at the top of a mountain a mile high than at a neighboring inland place 180 feet above sea level?

4. In what parts of the state of Maine are Moosehead Lake and the Rangeley Lakes?

5. About how far is it from Boston to Bar Harbor?

REVIEW

1. Explain how the mountain ranges of North America were formed.
2. Name the great highland regions of North America.
3. Where are the Atlantic Coastal Plain, the prairies, and the Great Plains of the United States?
4. Explain the cause of wind.
5. Why are there sea breezes in warm days at the seashore?
6. Why are the winters mild along the western coast of the country?
7. Why are the winters cold in the interior of the country?
8. Explain the cause of fog, clouds, and rain.
9. Give three different ways in which rain is caused.
10. Why is the climate very dry in the regions east of the western mountain ranges?
11. What winds in the eastern part of the country bring rain?
12. Describe the cyclonic storms of the United States.
13. Explain the work of the Weather Bureau.
14. What is meant by the annual rainfall?
15. State some of the customs of the American Indians.
16. Where do the Indians live at the present time?
17. What parts of the United States once belonged to the Spaniards?
18. Why were slaves first brought to this country?
19. Why did the people who settled along the New England coast form towns or townships?
20. Why did the people who settled farther south adopt a county form of government?
21. Name the five forms of government in this country.
22. Explain the cause of glaciers on mountains.
23. Why are soil and rocks deposited in places where glaciers melt?

Boulder left by the Ice Sheet

24. How are icebergs formed?
25. Describe the Greenland ice sheet.
26. Describe the great Ice Sheet of the Glacial Period.
27. What are boulders?
28. How were hills formed by the Ice Sheet?

29. What effects did the Ice Sheet have upon the soil in the northern part of the United States?

30. How do we know that our ponds and lakes are not very old?

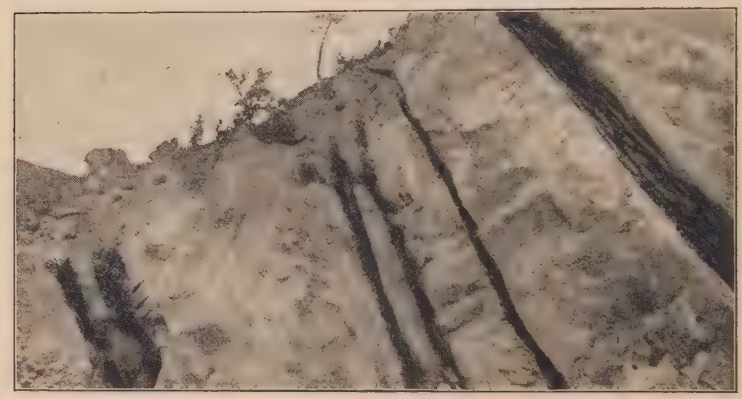
31. What was the cause of the waterfalls?

32. How did the Ice Sheet aid manufacturing in the northeastern part of the country?

33. Why has this section of the country a dense population?

34. Make comparisons in population between some eastern states and some western states.

35. Why is agriculture of great importance in our country?



Seams of Coal inclosed in Sandstone, California

36. Why does the soil differ so greatly in different parts of the Northeastern Section?

37. Explain how cream is separated from milk.

38. How are butter and cheese made?

39. State where fruits are produced in abundance.

40. In what parts of this section are there extensive forests?

41. Describe the business of lumbering in these forests.

42. What industry is causing forests to be cut down more rapidly now than formerly?

43. What are the Grand Banks?

44. Why are there many fish on the Grand Banks?

45. Why is the occupation of fishermen dangerous?

46. How are codfish caught and cured?

47. Name several other kinds of fish that are caught in the ocean.

48. How are lobsters caught?

49. Tell about the life of an oyster.
50. Explain how layers of sandstone have been formed.
51. How has limestone been formed?
52. Why do we sometimes find the prints of seashells on mountains?
53. Explain how crystalline rock was formed.
54. Explain why we are able to obtain granite in certain places.
55. Why are those granite quarries usually the most valuable that are situated on the seacoast?
56. Explain how quicklime is produced from limestone.
57. Why is coal the most important of all our minerals?

In the White Mountains

58. How were layers of coal formed?
59. Why do layers of coal appear at the surface in some places?
60. What kinds of coal are found in the eastern parts of the country?
61. Give reasons why iron is the most valuable of all the metals.
62. How has iron ore been formed?
63. Describe the process of smelting iron ore.
64. What is coke, and how is it prepared?
65. State a method by which iron is changed to steel.
66. What becomes of many of the iron and steel products of Pittsburg?
67. How were oil and gas probably formed in the rock of the earth?
68. How is petroleum obtained?
69. How is it conveyed from the wells to the refineries?
70. In what ways is kerosene sent to different parts of the country and to foreign countries?

71. Name some substances that are obtained by refining petroleum.
72. What uses are made of natural gas?
73. How is salt obtained from mines?
74. Why do waves run up on the shore?
75. How do waves produce sand and mud upon the shore?
76. Describe a tidal wave.
77. Explain how the moon causes tides.
78. Why is the tide very high in some places?
79. Why are cities on some rivers located at the head of tide water?
80. How have the waves affected the eastern part of Massachusetts?
81. How have many islands been formed along the New England coast?
82. Why has the sinking of the coast been an advantage to the present inhabitants of the country?
83. What is a drowned valley?
84. Explain how the location of New York has helped to make it a very large city.
85. Tell about the increase of the population of New York.
86. State some of the measures that have been taken to accommodate so many people.
87. Tell about the city of Boston.
88. Name some interesting historic events that occurred in Boston.
89. What advantages for manufacturing has the city of Philadelphia?
90. Name some articles that are manufactured there.
91. What famous buildings are there in Philadelphia?
92. Describe Baltimore.
93. Why has Washington become a large city?
94. Name some of the public buildings of Washington.
95. Why is the population of some portions of the Northeastern Section much increased during the summer months?
96. Describe the scenery of the state of Maine.
97. Name the most important mountain resorts of the Northeastern Section.
98. Describe the coast of Maine.
99. Name several watering places on the New Jersey coast.
100. Name some other summer resorts of New England.
101. In what direction from Boston are Marthas Vineyard and Nantucket Islands?
102. In what direction from New York is Block Island?
103. Name other interesting points in the state of New York.
104. In what part of New York State is Saratoga?
105. Between what lakes is Niagara Falls?

THE SOUTHERN SECTION

19. The Physical Features

In passing from the northeastern part of the country to the southeastern part, we go from a region of rocky hills and many lakes to one containing a great amount of comparatively level land well suited to agriculture.

The Appalachian system of mountains extends nearly across the eastern part of this section. In the South, as in the North, these ancient mountains have been so worn down that in places they have become mere hills, or even level land. In North Carolina and Tennessee there are still hills and mountains of considerable height. Mount Mitchell, the highest of the system, is more than a mile high.

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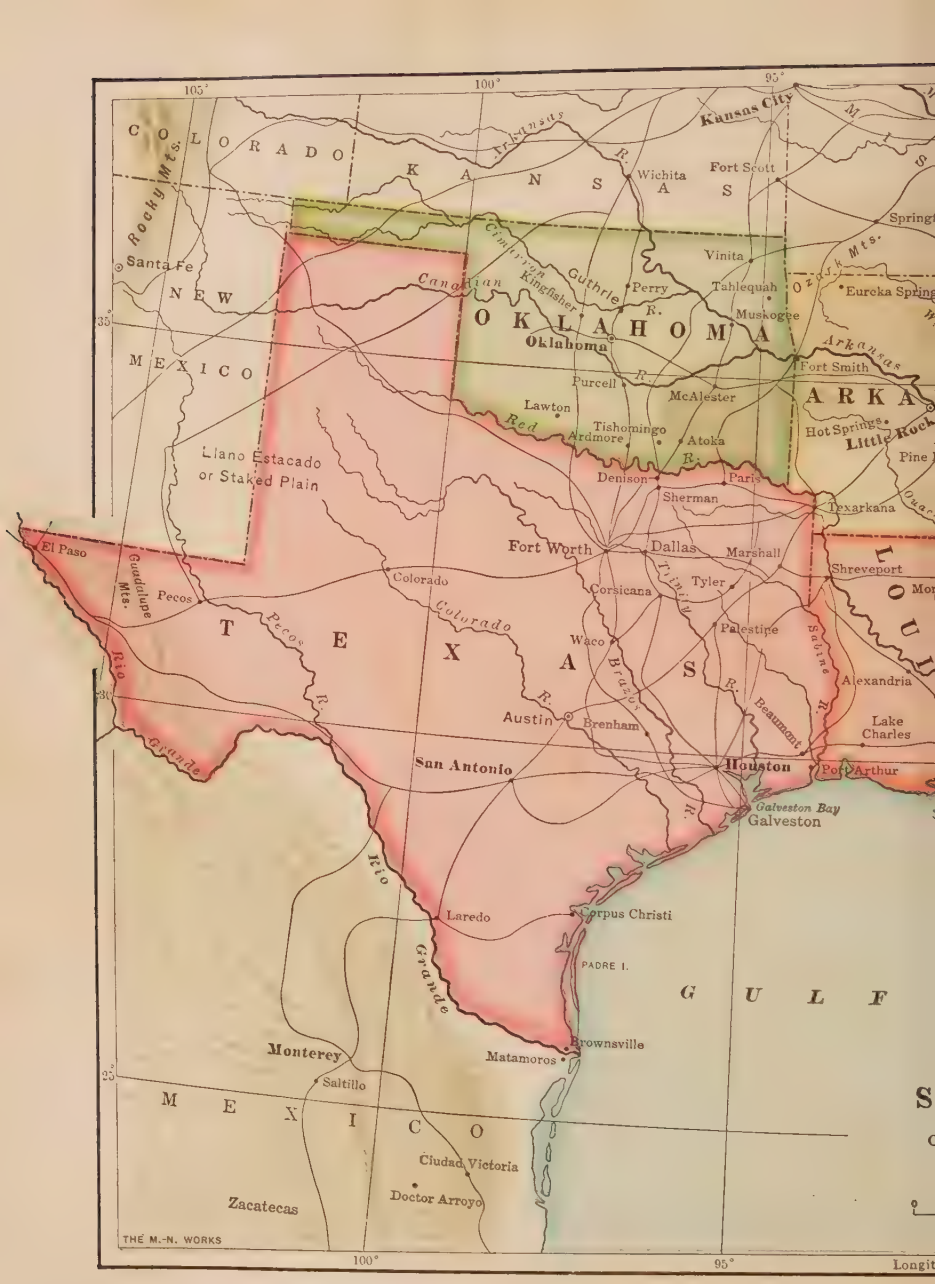
Mount Mitchell, from Pinnacle Mountain

A wide belt of country lying next to the mountai s on the east is nearly level, or covered with low hills with river valleys among them. This section is sometimes called the Piedmont Belt. The word *piedmont* means *foot of the mountain.* The name is given to the section because it lies along the foot of the


105°
100°
95°
35°
30°
25°
COLORADO
KANSAS
Kansas City
Arkansas R.
Wichita
Fort Scott
Rocky Mts.
Santa Fe
NEW MEXICO
Cimarron
Canadian
Kingfisher
Guthrie
Perry
Vinita
Tahlequah
Muskogee
Eureka Springs
OKLAHOMA
Oklahoma
Arkansas
Fort Smith
ARKA
Purcell
McAlester
Lawton
Red R.
Tishomingo
Ardmore
Atoka
Hot Springs
Little Rock
Llano Estacado or Staked Plain
Denison
Paris
Sherman
Texarkana
El Paso
Guadalupe Mts.
Pecos
Fort Worth
Dallas
Marshall
Shreveport
Colorado
Corsicana
Trinity
Tyler
Colorado
Pecos R.
TEXAS
Waco
Palestine
Sabine R.
Alexandria
Brazos R.
Beaumont
Austin
Brenham
Lake Charles
Rio Grande
San Antonio
Houston
Port Arthur
Galveston Bay
Galveston
Rio Grande
Laredo
Corpus Christi
PADRE I.
GULF
Brownsville
Matamoros
Monterey
Saltillo
MEXICO
Ciudad Victoria
Doctor Arroyo
Zacatecas
THE M.-N. WORKS
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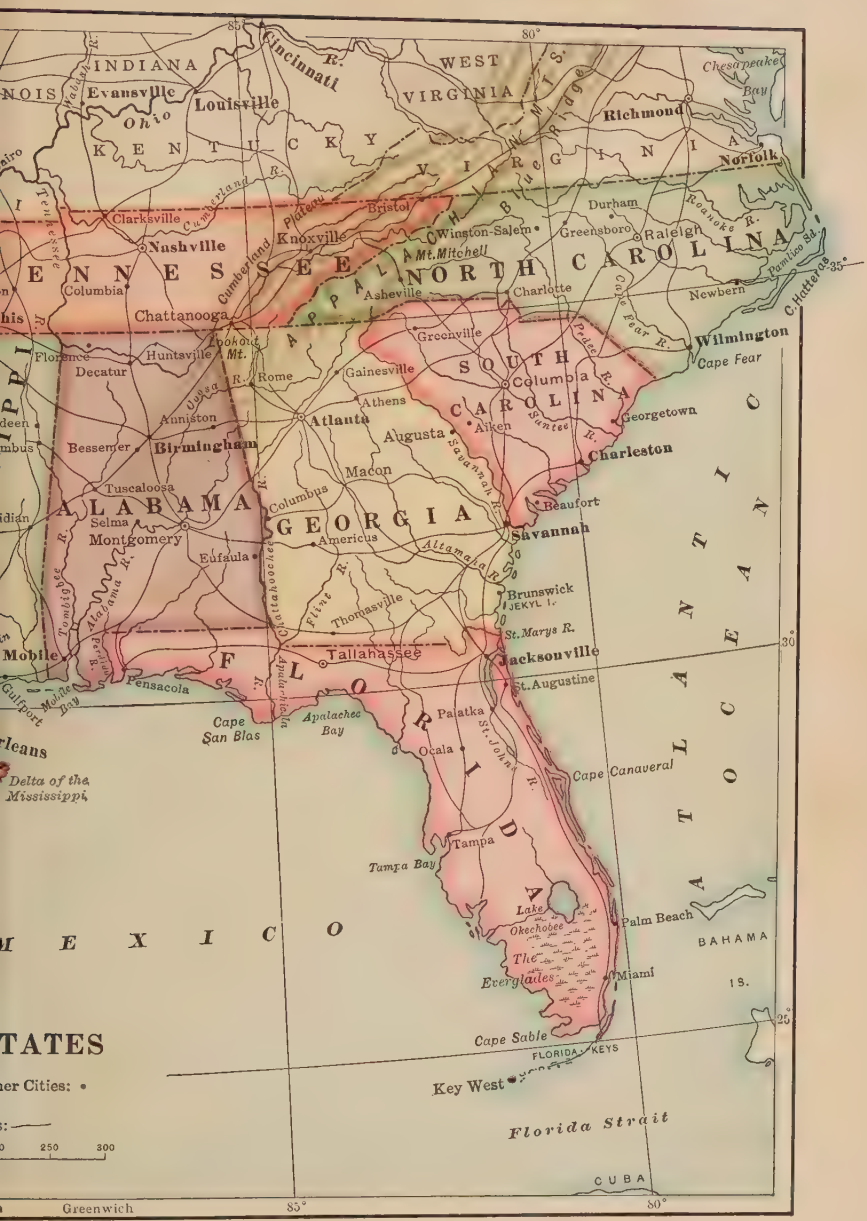

INDIANA
Evansville
Louisville
Ohio
Cincinnati
WEST VIRGINIA
Chesapeake Bay
Richmond
Norfolk
KENTUCKY
VIRGINIA
Clarksville
Nashville
Cumberland R.
Bristol
Knoxville
Winston-Salem
Greensboro
Durham
Raleigh
Roanoke R.
Pamlico Sd.
Mt. Mitchell
Asheville
Charlotte
Newbern
C. Hatteras
Columbia
Chattanooga
Cape Fear R.
Wilmington
Cape Fear
Florence
Decatur
Huntsville
Lookout Mt.
Rome
Gainesville
Greenville
Pee Dee R.
Columbia
Georgetown
Aiken
Santee R.
Charleston
Anniston
Atlanta
Athens
Augusta
Savannah R.
Bessemer
Birmingham
Macon
Tuscaloosa
Selma
Montgomery
Columbus
Americus
Beaufort
Savannah
Eufaula
Altamaha R.
Brunswick
JEKYL I.
St. Marys R.
Thomasville
Tallahassee
Jacksonville
St. Augustine
Mobile
Pensacola
Gulfport
Mobile Bay
Cape San Blas
Apalachee Bay
Palatka
St. Johns R.
Ocala
Cape Canaveral
Delta of the Mississippi
Tampa
Tampa Bay
Lake Okechobee
The Everglades
Palm Beach
Miami
BAHAMA IS.
Cape Sable
FLORIDA KEYS
Key West
Florida Strait
CUBA
Greenwich
85°
80°
35°
30°
25°
TATES
her Cities:
0 250 300

Appalachian Mountains, where the land has been formed by the wearing away of the mountains.

The strip of country between the Piedmont Belt and the ocean is generally low, level, and sandy. It is a part of the Atlantic Coastal Plain. All this land was once beneath the ocean. The soil was formed by the wearing effect of waves on the shore, or from mud carried into the ocean by rivers.

A Southern River

There is a striking contrast between the northern and southern coasts. While in the North the sinking of the land has produced islands, drowned valleys, and deep harbors, in the South the land has risen enough to make dry land of a strip of the ocean bed. Since mud was spread evenly by the waves over the ocean floor, this floor became level land after it rose above the water. The even bed of the ocean made an unbroken coast line, without many capes and bays. Since this period of rising, the southern coast has settled again a very little. This has been an advantage by increasing the depth of the water in the mouths of rivers and in the harbors. In the shallow water near the shore the waves have washed

up sand from the bottom and formed long islands called sand bars or barrier reefs. In a similar manner a low coastal plain has been formed along the Gulf of Mexico.

A large part of southern Florida is elevated but little above the sea, and portions of it consist of extensive marshes, or swamps. The largest of these is called

A Florida Swamp

the Everglades. The islands near the southern coast are called the Florida Keys from a Spanish word which means islands. The surface of portions of the land in southern Florida and upon the Keys has been formed by minute animals called coral polyps. In parts of the ocean where the water is warm and shallow these animals live in great numbers attached to the bottom, and when they die their stony skeletons remain. They continually grow and die, and as the masses are raised above the surface, coral reefs or coral islands are formed, which the force of the waves slowly crumbles into soil.

In the Southern Section we may include the states bordering on the Atlantic Ocean and the Gulf of Mexico, from North Carolina to Texas, and the states of Tennessee, Arkansas, and Oklahoma.

These states, which are usually called the Southern States, are among the richest possessions of the country. For many years they have suffered the terrible results of the Civil War, in which they lost a vast amount of property and the lives of many of their bravest young men. But since the close of that war they have advanced rapidly in wealth and general prosperity.

When the rich and well-watered lands of the "sunny South" are fully occupied and cultivated, they will provide homes for many millions of people. Texas is the largest of all our states. It is difficult to realize its size. It contains four times as much territory as the whole of New England. It is larger than any country of Europe except Russia. It is believed that it will at some time be able to support one half as many people as the whole country now contains.

1. Across which of the Southern States do the Appalachian Mountains extend?
2. What states south of Delaware border on the Atlantic Ocean?
3. What states border on the Gulf of Mexico?
4. Name several rivers of the Southern States that flow into the Atlantic Ocean.
5. Name several rivers that flow into the Gulf of Mexico.
6. Name two rivers of the Southern States that flow into the Mississippi from the west.
7. What river forms the boundary between Texas and Mexico?
8. Why are there fewer good harbors in the Southern States than in the states of the Northeast?
9. Sketch a map of the Southern States, locating the mountains and the principal rivers.

20. Cotton

The leading occupation of the people of the South is agriculture. The early settlers of this region found the country very different from that occupied by the colonists in the North. The land was more level and fertile and the summers were longer and warmer. These conditions were favorable to agriculture, and for a long time but few people were engaged in anything else.

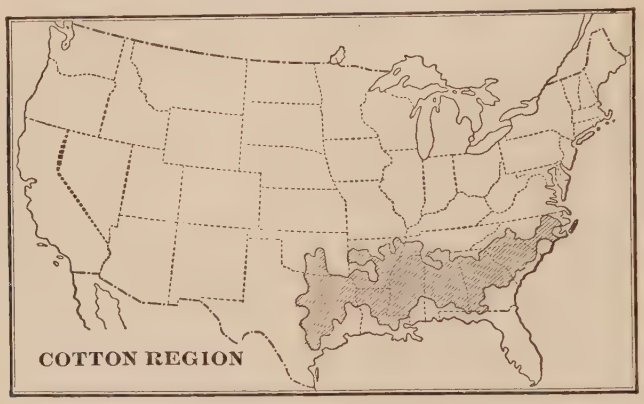
Scene on a Cotton Plantation

The leading crop for most of the Southern States, including those from North Carolina around the coast to Texas, has been cotton. The cotton plant requires fertile soil, long, warm summers, and plenty of moisture, which is brought by winds from the ocean and from the Gulf of Mexico.

There was a good market in the cities of Europe for all the cotton that could be raised in the South. The great difficulty was the lack of people to do the work.

To plant the crop, to care for it during the summer, and to harvest the cotton and prepare it for market in the fall required the labor of many people on each plantation, and the population of that part of the country was small.

At that time slaves from Africa were sold in different parts of the world, and the planters of the South



found that the most profitable way to raise cotton was by the purchase of these slaves. The Africans were accustomed to a warm climate and they could easily be taught to do the simple work in the fields.

After Eli Whitney invented the cotton gin, in 1793, the business of raising cotton became much more profitable than before because this machine removed the cotton seeds very rapidly. After that time slaves were brought into the country in great numbers. Although these people are no longer slaves, the greater proportion of them still live in the South. In some of the agricultural regions there are at the present time more colored people than white people.

We are all proud of the cotton crop of the South. The United States is the greatest farming country in the world, and we have immense quantities of various crops to sell, but we receive more money for the cotton that we sell to foreign countries than for any other crop.

The people of the South raise about three fourths of all the cotton that the world produces. Some is raised in India, and a little in Egypt, China, South America, and other countries. Foreign nations have encouraged their people to raise cotton upon their own territory instead of buying so much from America, but without much success. We have the best soil and climate for the cotton crop, and our planters have had many years experience. For a long time to come we shall probably furnish the world the greater part of its supply.

Cotton Gin

On account of its cheapness cotton is used more than any other substance for clothing. Only about one third of the human race have become so far civilized as to clothe themselves completely. As the remaining two thirds become accustomed to wearing more clothing, the demand for cotton will increase, and this will encourage the planters of the South to cultivate more land and raise larger crops.

It is a gratifying thought that we are able to supply the wants of so many people. If our planters should cease to raise cotton, it would be a world-wide calamity. A large part of the manufacturing of New England and of the South would be ruined, the mills of Great Britain would close, millions of employees would be reduced to distress, and clothing would become scarce and expensive in every country of the world.

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Cotton at the Railway Terminus in Savannah

More than one half of our crop of cotton is sent to other countries. The manufacturers of Europe are paying our planters, upon the average, more than a million dollars a day for their supply.

Formerly the greater part of the cotton that remained in this country was manufactured in New England, but within the past few years so many mills have sprung up in the South that more cotton is now manufactured in the region where it grows than in the North.

On islands near the coast of South Carolina and in Georgia and Florida a kind of cotton grows called sea-island cotton. The plant reaches a height of ten or twelve feet and the fibers are much longer and stronger than those of the ordinary "upland cotton." This variety sells at a high price and is used for the finest threads, laces, and cambrics.

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A Georgia Cotton Mill

Besides the cotton fibers, other parts of the plant, called the by-products, are becoming more and more valuable. Cotton-seed oil, obtained by pressing the seeds, is used for making cottolene, which is a substitute for lard, and for manufacturing soap. Much of it is used instead of olive oil. Miners burn it in their lamps. Small fish, called sardines, are packed in it. Over one hundred million dollars a year is now obtained for oil and meal produced from cotton seed that was once thrown away as useless.

It has been discovered that paper can be made from the stalks of the cotton plant. These stalks, which have been an inconvenience in the fields after the har-

vest, may increase the profits of the planters by many million dollars more.

1. When our cotton crop amounts to eleven million bales, each weighing about five hundred pounds, about how many pounds do we produce?

2. What would the value of this crop be at an average price of ten cents a pound?

3. If the seed from this cotton were worth one hundred million dollars, about what part of the value of the cotton would be equal to the value of the seed?

4. Who was President of the United States at the time when the cotton gin was invented?

5. Name several New England cities in which a large amount of cotton is manufactured.

6. More cotton is raised in Georgia and in Texas than in any other states. Name a seaport in each of these states from which cotton may be shipped away.

7. On what bodies of water would a vessel sail in carrying a load of cotton from Galveston to Liverpool, in England?

8. Describe the voyage of a ship carrying a load of cotton from New Orleans to Hamburg, in Germany.

21. Rice and Sugar

Rice and sugar are important crops on some of the low, fertile land along our southern coast.

Rice is the chief food of about one half of the world's people. Many millions in China, Japan, and India live almost wholly upon it. It is more expensive than other grains because more labor is required to produce it. A comparatively small amount is raised in the United States because there is only a small portion of land upon which the crop can be made profitable.

Rice plants thrive only where the climate is warm and the soil is very moist. During a part of the time while they are growing the land must be covered with water. Portions of the low coastal plains in some

of the Southern States are favorable for the crop. Formerly South Carolina and Georgia produced more than other states, but in recent years Louisiana and Texas have raised large quantities. On low and level regions in these states the land can be flooded easily through canals from rivers or by pumping water to ele-

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Cultivating Rice in South Carolina

vated positions from which it will flow over the fields. In some localities water for the rice crop is obtained from artesian wells.

When the crop is ripe, the water is drawn off, and the harvesting is done by teams and machines like those used in wheat fields on the prairies. As the grain comes from the thresher it has a dark color on account of the hulls in which the seeds are tightly wrapped. Before it is ready for the market it is run through machines that remove the hulls and polish the seeds.

Sugar was once made almost entirely from sugar cane, and since that plant requires a long, hot summer, it could be raised only in very warm regions of the earth. Sugar

forms a part of the substance of a great variety of vegetables and fruits and might be obtained from them if the process were not too expensive. Many years ago it was discovered in Germany that sugar could be made profitably from beets, and since beets will thrive in a cool climate, that discovery has greatly increased the territory in which sugar may be produced. Countries situated in

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A Field of Sugar Beets in Colorado

temperate regions were once obliged to purchase all their sugar from abroad. Many of these are now able to produce at least a portion of what they consume.

More sugar is used in the United States than in any other country. The average American citizen consumes more than one half of his weight in sugar every year. But we produce in our home country only a small part of this sugar. The money that we receive for all the

wheat that we sell to other countries is not sufficient to pay for the sugar that we are obliged to buy. This is because we have not yet raised a very large amount of beet sugar and because there is only a small amount of land in the country where sugar cane will grow well.

Since the island of Porto Rico, the Hawaiian Islands, and the Philippine Islands have come into our possession, we have considerably increased the amount of our territory upon which sugar cane will grow.

Planting Sugar Cane

We now raise more beet sugar than cane sugar, and the time will probably come when we shall buy less than we do now from other countries. Most of our cane sugar is produced in Louisiana on the plains of the valley and delta of the Mississippi. Many of the plantations there are very large. Some of them extend for fifteen or twenty miles along the banks of the river.

The crop is raised by burying stalks of cane in furrows. Sprouts spring up from these and become plants resembling Indian corn. When the crop is mature, the tall stalks are cut down, loaded on cars, and drawn to

the mill, which is usually erected near the center of the estate. Here the cane is run through rollers which press out the juice so completely that the remaining part is dry enough to use as fuel for the fires.

The juice is then boiled until the water escapes from it and there remains a mixture of brown sugar and molasses. The refuse molasses, which is separated from the sugar, is of very poor quality and is used as food for stock or for certain manufacturing processes. Molasses and sirup, which are used for cooking and for the table, are prepared from the pure juice of the cane.

Dark-colored sugar, produced in this manner, is called raw sugar. It must be purified, or refined, before it is ready for the market. Since a sugar refinery is very expensive, much of the sugar produced on the islands in tropical regions and on the smaller plantations in the South is first sold in the raw state and then shipped to refineries. On some of the larger plantations refining is done in the mills where the sugar is first produced.

1. How many tons of sugar per year would ninety million people consume, if each should consume seventy-five pounds, upon the average?

2. What would be the value of this sugar at five cents per pound?

3. Name several ports to which imported raw sugar may be taken to be refined.

4. What states would a vessel pass in carrying a load of rice from Charleston to New York?

5. Find about how long the voyage of a ship would be from Galveston to Boston.

6. On what bodies of water would a vessel sail in taking a load of sugar from New Orleans to Baltimore?

7. Make a map of those states of the Southern Section that border on the coast, showing the largest rivers and the cities from which cotton, rice, and sugar may be shipped.

22. Forests

One of the extensive forest regions of the country is in the South. The most common southern tree is the pine. A pine belt about one hundred miles wide extends along the coast of the Atlantic Ocean and the Gulf of Mexico. On portions of this Coastal Plain the land is too sandy for agricultural crops, but is well adapted to the growth of pine forests.

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Southern Pine Woods

Lumber from the southern pine is much harder and heavier than that from the white pine of the North. Much of it is used in the North for floors and the interior finish of buildings.

The pine trees of the South, that are known as "Georgia pine," grow very tall and straight. Many are used for the masts of ships and for heavy timbers.

In the absence of water power on these level plains, much of the timber is sawed into lumber by portable steam mills, which are set up in the forests and

moved about from place to place. The logs are drawn to these mills on wagons or on cars, and the lumber is shipped away on railroads or on river boats.

The pine forests yield a great amount of tar, pitch, resin, and turpentine. These products are called "naval stores." Tar is obtained by heating pine wood, and causing the gummy sap to flow out. It is used for calking the sides and decks of vessels to prevent leaking, and in making ropes for the rigging of vessels.

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Turpentine Boxes and Cups

Turpentine is prepared from the sap that runs under the bark of pine trees. Strips of bark are cut from the trees, and the sticky sap runs down and fills notches, called "boxes," that are cut in the wood, or flows into cups. Every few days it is collected and taken to the distillery. There it is mixed with water and heated in a great kettle. The sap consists of resin and turpentine. The heat converts the turpentine into vapor, which rises and passes through a tube. The tube is kept cold by a stream of water, and as the vapor cools it changes to liquid again and a stream of turpentine flows out at the end. The resin remains in the kettle, and both turpentine and resin are sent to market in barrels.

Turpentine is used for making varnish and mixing paints. Resin is largely used in varnish and in soap.

A tract of pine forest from which turpentine and resin are obtained is called a turpentine "farm." The size of a farm is reckoned in the number of "boxes." A farm may consist of many thousand, or even several hundred thousand boxes. The value of the products of these farms has amounted to over twenty-five million dollars in a single year.

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Resin on Wharf at Savannah

At first the business of turpentine farming was confined chiefly to the Atlantic coast, and the products were mostly shipped from Charleston, South Carolina. But after a time trees from which tar products are taken become exhausted and die, and the farming must be transferred to other regions. After the business declined in the forests of South Carolina, Savannah became the chief center of trade in tar, turpentine, and resin. At present turpentine farming is carried on chiefly in the states along the Gulf coast, and more naval stores are shipped from Pensacola than from any other city.

In the mountainous regions of the South there are many oak trees. The lumber from these is harder and stronger than pine. The bark of oak trees is used for tanning hides. In the North, hemlock bark is much used for that purpose. The acid of hemlock bark gives leather a red color, but oak bark produces a tan color.

Cypress trees from southern swamps are valuable for lumber. Cypress shingles will last for many years.

The palmetto tree, the name of which means small palm tree, is very common in the South. South Carolina is often called the "Palmetto State." Another common tree is the live oak, the branches of which are usually covered with mosses hanging in long festoons.

Palmettos

1. A large amount of lumber is manufactured at Macon and at Montgomery. Why are these places favorable for that business?

2. A large amount also is manufactured at Mobile and at Chattanooga. Locate these cities.

3. Hard pine lumber is shipped north from Charleston, Savannah, Jacksonville, and Pensacola. Locate each of these.

4. Oak and other hard wood lumber is shipped from Memphis. Through what states would a carload probably pass on its way to Philadelphia?

5. Why are large quantities of naval stores shipped from Pensacola?

6. Name a number of purposes for which oak lumber is used.

23. Various Products

For many years little besides cotton was produced upon most plantations in the South; but the planters are learning that there is greater profit in raising a variety of crops. Various kinds of plant food are slowly prepared in the soil by the processes of nature, and these different kinds of food are needed for different crops.

A Tobacco Field

Land that has become so exhausted that it will not yield a profitable crop of cotton may produce an excellent crop of some other kind. After two or three years it may be prepared to support a good crop of cotton again.

The flavor of tobacco depends so much upon climate and the quality of the soil that it is a special crop in particular localities. A large amount is produced in Virginia, Kentucky, Tennessee, and North Carolina. The manufacture of cigars is the most important industry of Key West, which is the largest city of Florida.

Tobacco for the purpose is obtained from Havana on the island of Cuba.

Much Indian corn and wheat are now raised on southern plantations. Considerable corn is used in the South for food, and more for fattening swine.

Sweet potatoes are a special crop in North Carolina, and many peanuts are produced in North Carolina and Virginia. Norfolk is the leading peanut market in the

An Orange Grove in Florida

country. The peanut plant is very peculiar. Pods first form on the ends of stalks, which then bend down and bury the pods in the earth. After they ripen the peanuts are dug up and dried.

Many southern planters raise early vegetables for northern markets. The states of the Central West obtain their supplies mostly from Mississippi and Louisiana, and those of the Northeast from Florida and Georgia.

Parts of the South produce great quantities of fruit. Florida begins to send strawberries to northern markets

as early in winter as December. Pineapples flourish on the Florida Keys. Sweet Florida oranges, which grow in the Indian River section, have a wide reputation. Georgia is noted for its fine peaches.

Many cattle are pastured on parts of the Coastal Plain in Georgia and Florida, among scattering forest trees. Mules are well suited to draw loads in warm weather,

Cattle on a Texas Ranch

and many of these are raised. Kentucky and Tennessee produce large numbers of mules and horses.

The western part of Texas, where the climate is too dry for agriculture, is devoted to grazing, and large herds of cattle and sheep are reared upon the plains. The "Llano Estacado," or staked plain, which is now occupied by ranches, was once the winter feeding ground of great herds of buffaloes. It is about five hundred miles

long from north to south and nearly three hundred miles wide. It received its name because it is so level and so broad that travelers were liable to lose their way upon it and routes of travel were marked with stakes.

The South, like Pennsylvania, has its coal and iron region. In the vicinity of Birmingham, in Alabama, coal, iron, and limestone are easily obtained and pig iron is produced very cheaply.

A substance called phosphate rock is found in the vicinity of Charleston, South Carolina, and in the central part of Florida. It is the fossil remains of the bones of ancient animals. Much of this rock is shipped to the North and to Europe, where it is used as a fertilizer.

In Georgia there are valuable quarries of granite and marble. Many public buildings in the United States are made of Georgia marble.

The state of Oklahoma has a great variety of natural wealth. It was not open to white settlers till the year 1889, but it is already well covered with prosperous farm homes and contains many thriving towns and cities. In addition to its wealth in fertile land the state contains rich beds of coal and petroleum.

1. Durham, in North Carolina, has large tobacco factories. In what part of the state is it?

2. Where is Key West situated?

3. Through what states would peaches probably pass by train from Georgia to New York City?

4. In what part of Virginia is Norfolk?

5. Many cattle are shipped from Dallas and Fort Worth. In what part of Texas are they?

6. There are rich oil wells near Beaumont. In what part of Texas is it?

7. There is a rich iron region around Chattanooga, in Tennessee. About how far is it from Birmingham?

24. Cities

There are fewer large cities in the South than in the North. This is partly due to the fact that the people of the South have engaged in agriculture instead of manufacturing and commerce. In agricultural regions there are always towns or cities where the farmers or planters may sell their crops and may buy the supplies that they need, but these purposes alone do not

Jackson Square, New Orleans

require very large cities. Cities that become large are usually manufacturing centers and distributing centers. Another reason for the small number of cities in the South is the fact that there are not so many good harbors along the southern coast as there are along the northern coast.

New Orleans, the chief city of the South, is situated about one hundred miles above the mouth of the Mis-

sissippi, at a point where only a narrow neck of land separates the river from Lake Pontchartrain. Large ocean vessels can proceed up the river as far as New Orleans, but not much farther. Above New Orleans the shipping is by barges and broad flatboats, which are able to move in very shallow water.

The great amount of mud that the Mississippi deposits in its bed has been a hindrance to navigation from New

Mississippi Jetties

Orleans to the Gulf, but this difficulty has been overcome by an ingenious device. Jetties have been built out from both banks toward the middle of the river. These make the river narrower and cause it to flow fast enough to carry the mud into the Gulf.

New Orleans has several interesting peculiarities. It was founded by the French, and the people in the French quarter of the city retain many of their old customs. The Mississippi, in its lower course, has deposited so much mud upon its bed and along its banks that its surface is higher than that of the surrounding country. For this reason embankments, called levees, have been

built along the river. They are carefully repaired to keep the Mississippi within bounds in time of high water. The slightest leak through the levees would cut away the soft soil very rapidly, and if not repaired, would soon flood the entire city.

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On the Levee, New Orleans

Everywhere in the city at a short distance below the surface the soil is filled with water. The houses can have no cellars, and the graves in the cemeteries are built of stone above ground.

New Orleans not only contains cotton factories and large sugar refineries, but is becoming one of the largest shipping centers of the country. It is the natural center for the commerce of the whole Mississippi Valley. If we were to take a trip up the Mississippi above New

Orleans, for hundreds of miles along the way we should meet flatboats, or barges drawn by flatboats. They would be loaded with bales of cotton from the towns and landings along the banks, or with coal from Pennsylvania, brought down from Pittsburg on the Ohio River, or with

Galveston

wheat and corn from the Missouri River or the upper Mississippi. At New Orleans cotton and grain are loaded upon ocean vessels and shipped to Europe.

It is said that if you kick a barrel of flour at Minneapolis, it will roll to New Orleans. Of course, this is not true, but it calls attention to the fact that the Mississippi Valley slopes gently downward from the state of Minnesota to the Gulf of Mexico. It is easier to send the products of the great farming regions of the Mississippi Valley to the sea by this route than by railroads that cross the Eastern Highlands.

The advantage secured by shipping goods out of the country by way of the Gulf has made Galveston, as well as New Orleans, one of the leading ports of the coun-

try. New Orleans and Galveston rank next after New York among our exporting centers.

Galveston is situated upon one end of an island near the coast and is connected with the mainland by a causeway. A great storm swept over Galveston in 1900, destroying many lives and laying a part of the city in ruins. Since that time a sea wall has been built, which, it is hoped, will prevent such a disaster in the future.

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Charleston from St. Michael's Church

Mobile has the only landlocked harbor on the Gulf of Mexico. Its harbor is so safe that no vessel has ever been lost in it.

Gulfport and Pensacola are now ranked among the leading ports of the South.

Savannah has a deep harbor, eighteen miles from the sea. The city contains many parks filled with tropical trees, and is called the "Forest City." It is an interesting fact that the first steamboat to cross the Atlantic sailed from Savannah in the year 1819.

Charleston has a good harbor and, lying between two rivers, has a water front on three sides.

Atlanta is situated near the southern end of the Blue Ridge Mountains, and because railroads can be built easily from that point to the West, it is an important railroad center. It is often called the "Gate City."

Peach Tree Street, Atlanta

Since the time of the Civil War manufacturing has increased rapidly in the South. There is water power for this purpose on several rivers that flow east from the mountains to the sea. Where these rivers pass from the Piedmont Belt to the Coastal Plain the water digs out the sandy soil of the Coastal Plain faster than it wears down the harder bed farther west. This causes rapids or falls in the rivers, and the border line along which the falls occur is called the Fall Line.

A line of manufacturing cities extends from New Jersey to Alabama along the Fall Line. On this line are the cities of Columbia, Augusta, Macon, and Montgomery. It is claimed that there is water power enough in the state of Georgia alone to drive all the mills in the United States.

A Pineapple Field in Florida

1. St. Augustine was founded in 1565. It is the oldest town in the United States. About how far is it from Jacksonville?

2. Palm Beach is a popular winter resort. In what part of Florida is it?

3. At Key West and Tampa there are many tobacco factories in which cigars are made from Cuban tobacco. Locate those cities.

4. Asheville, North Carolina, is a famous health resort. Is it in a mountainous district or a level district?

5. At Hot Springs, Arkansas, there are sulphur waters which are beneficial in certain diseases. In what part of the state is it?

6. Name the capital city of each of the Southern States that border on the Atlantic Ocean.

7. Name the largest city of each of the Southern States that border on the Atlantic.

8. Name the capital city of each of the states, west of Florida, that border on the Gulf of Mexico.

9. Name the largest city of each of these Gulf states.

10. Name the capital city and the largest city of each of the remaining states of the southern group.

REVIEW

1. How do the physical features of the southeastern part of the country differ from those of the northeastern part?

2. What is the Piedmont Belt?

3. Explain the formation of the Atlantic Coastal Plain.
4. How do the northern and southern coasts differ?
5. What are barrier reefs?
6. What are the Florida Keys?
7. How are coral reefs formed?
8. Give comparisons to illustrate the size of the state of Texas.
9. Explain how the cotton crop increased slavery in the South.
10. Name some foreign countries in which cotton is raised.
11. What part of the cotton of the world do we raise?
12. Why is so much cotton used in the world?
13. What would happen if our planters should cease to raise cotton?
14. How much cotton do we export?
15. What part of our cotton manufacturing is done in the South?
16. Describe sea-island cotton.
17. What by-products are obtained from cotton?
18. How extensively is rice used in the world?
19. Describe the method of raising rice.
20. Why has the discovery of the process of making beet sugar been a great advantage?
21. How is sugar cane raised?
22. How is sugar manufactured from sugar cane?
23. Tell about the lumber of southern forests.
24. Name some uses that are made of this lumber.
25. How is pine tar produced?
26. Explain the process of obtaining turpentine and resin.
27. For what purposes are turpentine and resin used?
28. Where is turpentine farming chiefly carried on?
29. Describe other forest trees of the South.
30. What southern states produce the most tobacco?
31. How do peanuts grow?
32. What parts of the South produce large quantities of fruit?
33. Describe the Staked Plain of Texas.
34. Where in the South are coal and iron ore obtained?
35. What is phosphate rock?
36. Why are there fewer large cities in the South than in the North?
37. Describe the location of New Orleans.
38. Explain the use of jetties in the Mississippi River.
39. State some interesting peculiarities of New Orleans.
40. Why is New Orleans a great shipping center?
41. Describe the city of Galveston.
42. Name several other ports along the southern coast.

THE CENTRAL SECTION

25. The Physical Features

When the people who had colonized the Atlantic coast made their way farther west through gaps in the Appalachian Mountain System, they came to a region surprisingly rich and inviting. Among the rocky hills

The Untamed Prairie

where they had first settled they had been obliged to clear the land of forests and large stones in order to make crops grow. Even after all the hard labor that this required, they usually had only hilly and rocky land that was not very fertile.

West of the mountains they found broad regions of comparatively level land, containing no trees, but thickly covered with grass, and very fertile.

Beginning with the Appalachian Mountains and table-

Longitude
West
105°
100°
95°
45°
40°
D O M I N I O N
Turtle Mts.
Lake of the Woods
Rainy R.
Grafton
Devils Lake
Minot
Souris R.
Mouse R.
Devils Lake
Grand Forks
Red River of the North
Red Lake
Sheyenne R.
NORTH DAKOTA
Lake Itasca
Leech Lake
Bismarck
Missouri R.
Jamestown
Fargo
Wahpeton
Fergus Falls
Brainerd
Mille Lacs
MINNESOTA
Little Missouri R.
Grand R.
Aberdeen
St. Cloud
Mississippi R.
Deadwood
Lead
Black Hills
North Fork
Cheyenne R.
Pierre
SOUTH DAKOTA
Watertown
James R.
Minneapolis
St. P
Red Wing
Faribault
Mankato
Minnesota R.
Huron
White R.
Mitchell
Sioux Falls
Mason City
Yankton
Niobrara R.
Missouri R.
Sioux City
Des Moines R.
WYOMING
North Platte R.
Loup R.
Norfolk
NEBRASKA
North Platte
Fremont
Omaha
Marshalltown
Cedar R
Des Moines
Council Bluffs
Oskaloosa
Grand Island
Platte R.
Plattsmouth
Lincoln
Kearney
Hastings
Nebraska City
Beatrice
Republican R.
Platte R.
COLORADO
Solomon R.
Atchison
St. Joseph
Chillicothe
Leavenworth
Kansas City
Smoky Hill R.
Kansas R.
Topeka
Lawrence
Kansas City
Sedalia
Great Bend
KANSAS
Ottawa
Jefferson City
Arkansas R.
Hutchinson
Emporia
Neosho R.
Ft. Scott
Osage R.
Nevada
Wichita
Pittsburg
Arkansas City
Parsons
Joplin
Springf
Ozark Mts.
NEW MEXICO
OKLAHOMA
TEXAS
THE M.-N. WORKS.

CENTRAL STATES
Capitals of States: ⊙ Other Cities: ∘
Principal Railroad Lines:
0 25 50 100 150 200 250
Scale of Miles
CANADA
Greenwich
85°
80°
45°
40°
ISLE ROYAL
SUPERIOR
St. Marys R.
Calumet
Ishpeming
Marquette
Sault Ste. Marie
Escanaba
Str. of Mackinac
MACKINAC I.
Cheboygan
LAKE HURON
Georgian Bay
Alpena
Marinette
Menominee
Green Bay
Manistee
Saginaw Bay
Bay City
Saginaw
Flint
Port Huron
St. Clair R.
Lake St. Clair
Toronto
ONTARIO
L. ONT.
Niagara Falls
Buffalo
NEW YORK
Green Bay
Manitowoc
Sheboygan
Lake Winnebago
Milwaukee
Muskegon
Grand Rapids
Lansing
Battle Creek
Kalamazoo
Jackson
Ann Arbor
Detroit
Racine
Rockford
Evanston
Chicago
Oak Park
Aurora
Joliet
Kankakee
Elkhart
South Bend
Goshen
Michigan City
Gary
Hammond
Adrian
Toledo
Sandusky
Cleveland
Akron
Youngstown
Erie
LAKE ERIE
Findlay
Lima
Massillon
Canton
East Liverpool
Alliance
Pittsburg
Steubenville
Mansfield
Fort Wayne
Logansport
Marion
Bloomington
Danville
Lafayette
Anderson
Muncie
Piqua
Newark
Zanesville
Wheeling
MD.
Decatur
INDIANA
OHIO
Richmond
Springfield
Dayton
Columbus
Marietta
Chillicothe
Terre Haute
Indianapolis
Hamilton
Cincinnati
Parkersburg
WEST VIRGINIA
Portsmouth
Covington
Newport
Madison
Ironton
Charleston
Huntington
St. Louis
Jeffersonville
New Albany
Frankfort
Evansville
Louisville
Lexington
Owensboro
Henderson
KENTUCKY
Cairo
MAMMOTH CAVE
Bowling Green
Paducah
Middlesboro
Cumberland Mts.
VIRGINIA
NORTH CAROLINA
TENNESSEE
Nashville
Ohio R.
Kanawha R.
Big Sandy R.
Tennessee R.
Cumberland R.
Green R.
Kaskaskia R.
Wabash R.
Illinois R.
Menominee R.
Muskegon R.
Grand R.
Saginaw R.
Detroit R.
Maumee R.
Sandusky R.
Cuyahoga R.
Genesee R.
Niagara R.
Rouge R.
Ranger

lands, the surface of the Great Central Plain gradually slopes downward, for hundreds of miles, to the Mississippi River. Beyond the Mississippi it gradually rises again, for hundreds of miles, to the foot of the Rocky Mountains.

This vast tract of agricultural land, reaching across the country from our northern boundary to the Gulf of Mexico, is the richest farming region in the world. A good part of the wealth of which our country boasts has come from the bountiful crops of our great farm.

While the only inhabitants were Indians, all this territory served no useful purpose except as a pasture ground for herds of buffaloes. It has been estimated that before the year 1872 there were as many as eight million of these animals between the Mississippi River and the Rocky Mountains. Immense herds of them moved north or south from one feeding ground to another. In winter they found pasturage in the South, on the great plains of Texas. Their skins, covered with thick, woolly hair, were valuable for winter coats, and as the West was explored and occupied by white settlers the buffaloes were hunted and slain so rapidly that they were nearly all destroyed before measures were taken to protect them. Only a few hundred of these animals now exist. Most of these are carefully kept in the Yellowstone National Park and in other public and private parks of the country.

The great central section of the country is mostly free from mountain ranges because in the wrinkling of the earth's crust no high ridges were raised here, as in the eastern and western parts. In the formation of the

continent, as the land gradually rose above the surface of the ocean or settled below it, this section was raised or lowered more uniformly, instead of being thrown up in ridges. In the rock layers of the central lowland there are found fossils of shells and fish which were once in the ocean.

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Buffalo Herd in the Yellowstone National Park

The only exceptions to the uniformity of this great plain are two groups of low mountains called the Black Hills and the Ozark Mountains.

The soil in the southern part of this section has been mostly formed either by the slow decay of the rocks underneath or from soil washed down from other regions.

In the northern part the soil was largely the effect of the Ice Sheet. The ice scraped away and carried farther south the soil that had been previously formed, but left in its place, when it melted away, a deep, rich layer made by the grinding of rocks as the ice moved down from regions farther north. The rocks over which

the glacier passed in the central part of the country were softer than those in the East and were more easily ground into soil. This accounts for the larger amount of good soil left by the Ice Sheet in the states of the Central West.

Other effects of the Ice Sheet here were similar to those in the East, except that fewer waterfalls were produced. The Great Lakes and a large number of smaller lakes were formed by the ice. There are about ten thousand lakes in the state of Minnesota alone.

Different parts of the Great Central Plain have special names. A large region in the central part is called the Prairies. A broad strip of more elevated land east of the Rocky Mountains, which extends entirely across the country from north to south, is called the Great Plains.

1. How did the rivers that flow across the Appalachian ranges toward the east make it easier for the settlers to travel across the mountains?

2. Give the names of several of these rivers.

3. Why is it generally cooler in winter and warmer in summer in the central part of the country than in regions near the coast?

4. What effect do you think the Great Lakes have upon the climate of the regions near them in winter and in summer?

5. Name in order the states that border on the Great Lakes.

6. What two rivers unite to form the Ohio River?

7. What states border on the Ohio River on the north and on the south?

8. Name the states that border on the Mississippi River on the east.

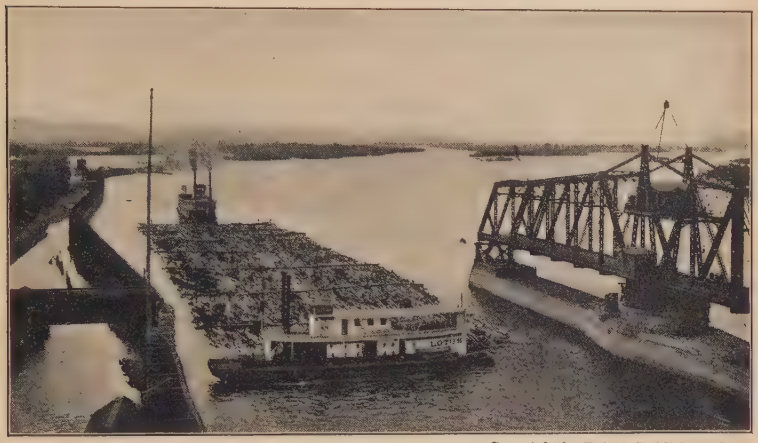
9. Name the states that border on the Mississippi on the west.

10. Name in their order the row of states immediately west of those that border on the Mississippi.

11. Make a map of the states that border on the Ohio River.

26. The Mississippi River System

The Great Central Plain, together with the mountain slopes on either side, contains one of the largest river systems of the world. The changes wrought by rivers on the face of nature, and the effects of such changes upon the welfare of mankind, are very impor-



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Scene on the Upper Mississippi

tant. We should be particularly interested in the effects of our own great river, which the Indians called the "Father of Waters."

The Mississippi River is 2600 miles long, and the Missouri 3100 miles long. The combined length of the Missouri and that part of the Mississippi below the mouth of the Missouri is 4350 miles. If we consider the Missouri and the lower part of the Mississippi as one continuous river, we may say that it is the longest river in the world.

All the water that flows in the rivers of this great territory, with the exception of a small section in the South, finds its way into the Mississippi and then into the Gulf of Mexico. The entire region drained by all these streams is therefore called the Mississippi Basin.

We know that every river, from the point where it rises in highlands or mountains to the point where it

Great Falls of the Missouri River

flows into another body of water, is constantly producing interesting and important changes. Hills and mountains are worn down, valleys are filled with rock waste, or soil, and portions of the land of the continent are carried into the ocean by the force of running water.

The faster water runs, the greater power it has to wear away the soil, carry off waste particles, and move small rocks along. Near the sources of most rivers, in the hills or mountains, there are many cataracts and falls, and often some farther along in their middle courses. The water, flowing swiftly over these, wears

the rocks into particles and carries the waste along, together with soil that is carried into the rivers by hundreds of brooks during heavy rains.

Farther down in a river, where it flows more slowly, much of this matter settles and forms a mass of mud in the bed or along the banks. In some parts of such a

A Flood Plain

river the water moves faster than in other parts. Here the moving water carries away the mud and so wears out a deeper channel. In a very long time the bed in the shallow parts may be built up so high and the channel worn so deep that there will be room enough in the channel for all the water to flow.

By this slow process, continued through thousands of years, a tract of level land is formed in a river valley, with the river flowing through it. Such land is called an alluvial plain or the flood plain of the river.

The flood plains of some of the rivers of the Mississippi System, such as that of the Ohio River, are still so low that there is danger of overflow in times of

heavy rain. Buildings are sometimes destroyed and people are drowned when there is an unusual rise in such a river.

When a river overflows its banks, soil settles from the water, each time building up the flood plain a little higher. The greatest amount settles when the water first passes over the banks, hence these become higher than the land farther away, and have a gradual slope away from the river. The elevated banks have the

Flood on the Ohio River at Lawrenceburg, Ind.

favorable effect of preventing the river from overflowing as much as it otherwise would. Along some rivers it is necessary to make the banks still higher by constructing levees to prevent the water from overflowing and destroying the crops. Wide sections of the flood plain of the Mississippi near its mouth are lower than the banks of the river. When the river is high, great care is taken to prevent it from breaking through.

A river usually flows more slowly as it approaches its mouth, and since in slowly running water only very

small particles of soil can be carried along, the soil of flood plains near the mouths of rivers is usually very fine and fertile. When the Mississippi reaches the Gulf of Mexico, it still carries a large amount of very fine soil, and this has built up a large and fertile delta.

Rivers do not usually flow in straight lines, but make curves to the right and left across their flood plains. It is a curious fact that after a slight curve has been started in a river it will continually increase. The running water strikes with greater force against the bank on the outside of a curve than against that on the inside, and digs farther into the land. Sometimes long loops with narrow necks, called ox-bow loops, are formed in this way. After a time the river may wear its way entirely across the neck of a loop and then flow in a more direct course, instead of flowing through the loop. There are so many bends and loops in the Mississippi River that the distance by a river boat from New Orleans to St. Louis is much greater than it is in a direct line.

The best farming land of a country is usually on the flood plains of its rivers. The rich soil of these "bottom lands," or "intervals," composed of river mud, produces very large crops. In some countries the greater part of the population is to be found on such flood plains. Below its union with the Ohio River the Mississippi flows through a flood plain from fifty to seventy miles wide.

1. In what season of the year do rivers carry away the greatest amount of soil?

2. There are often sand banks, or bars, in rivers at points where they begin to flow more slowly. Why is this?

3. Why do not ships moving up a river go in a straight line along the middle of the river?

4. Why is the land in river valleys generally level?

5. Why does the land of flood plains contain no stones?

6. Why are several cities along the Mississippi built upon high bluffs?

7. Why does a large part of the population of some countries live upon the flood plains?

8. Make a map showing the Mississippi River and the rivers flowing into it, which are called its tributaries.

27. Wheat and Corn

On the Great Central Plain of the United States are the most extensive grain fields and corn fields in the world. The land is generally free from rocks and trees. The fields are so broad and level that the largest and most improved machines can be used in cultivating and harvesting the crops. The soil is very fertile and deep. In other places, as in portions of the eastern part of the country, the soil furnishes so little plant food that expensive fertilizers must be added to make the crops grow, but in this section there is generally so much plant food in the soil that abundant crops will grow year after year, if there is rain enough to prevent drought.

Winds from the Atlantic Ocean and the Gulf of Mexico, passing freely up the Mississippi Valley, usually carry moisture enough to supply the needs of the crops. These winds are frequently a disadvantage. Since they are not checked by mountain ranges, they sometimes blow with great violence and destroy crops and buildings. In winter severe snowstorms with high winds often sweep over the northern part of the country. Such storms are called blizzards.

The use of machines and the great fertility of the soil

make it possible to raise here immense quantities of the great food crops of the world. Some of the cities of Europe depend largely upon this great American farm region for their supply of food. If all the grain fields of the United States were combined, they would cover

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A Harvester drawn by Thirty-three Horses

a territory as large as five or six of the smaller countries of Europe.

Wheat is raised to a large extent in all of the Central States. A section especially noted for the wheat crop is called the Red River Plains because it lies in the valley of the Red River of the North. These plains are nearly as level as the ocean. When the Ice Sheet moved down across the country, it extended across the valley

of the Red River of the North. It prevented the water from flowing north and caused it to form a great lake in front of the ice. As the ice melted, the soil that it contained was spread evenly over the bottom of this lake. When the ice had all melted, the river flowed north again and the bed of the lake became dry and level land.

This Machine plows and sows at the Same Time

Over this region in summer there are fields of waving wheat as far as the eye can see. The most extensive of these level wheat farms are in Minnesota, North Dakota, and South Dakota. There are farms in that region each containing thousands of acres of wheat and employing hundreds of men.

Our entire wheat crop usually amounts to more than seven hundred million bushels a year. This immense quantity furnishes business for many railroads, steamboats, and canal boats that carry wheat to flour mills and take both wheat and flour to the cities of the East and to seaports from which they are shipped abroad.

The United States is by no means the only country in which a great amount of wheat is raised. Wheat is becoming the most common and popular article of food among the civilized peoples of the world. It is an important crop in so many regions of the earth that at all times of the year there are farmers in some countries

Grain Elevators

engaged in the wheat harvest. The countries of Europe raise about one half of the world's supply of wheat, but in addition to this amount they buy nearly all that other countries have to sell.

We also raise a vast amount of corn in the Central States. Since we use but little corn for food and see comparatively little carried on cars and boats, it does not attract our attention as much as wheat. To many it will be a surprising statement that we usually raise more than three times as many bushels of corn as of

wheat. Our corn crop usually amounts to over two and one half billion bushels. Some of the corn is shipped away to market, but a large part of it is fed to live stock upon the farms.

A considerable quantity of corn is used in manufacturing certain products. We all know what corn starch is. More than one half of every grain of corn is composed of starch of fine quality, and there are many factories in the country which manufacture it. By treatment with certain acids the starchy part of corn is converted into a sirup called glucose.

From the yellow germs of the grains corn oil is pressed. This is sometimes used as a substitute for olive oil and for making paint and soap.

By a process called vulcanizing, corn oil is changed to corn rubber. It is cheaper than gum rubber and is mixed with the gum for making rubbers and rubber boots.

Corn stalks, which farmers formerly left in the fields to decay, are very useful. It has been found that good paper may be made from the outer portions. Even the white pith in the interior of the stalks is put to interesting uses. It is similar to cotton in composition, and is used in place of cotton in the manufacture of celluloid. Like cotton, when soaked in acids it becomes gun cotton, a very powerful explosive.

1. Why are the farms larger in the central part of the country than in the eastern part?

2. Find about how much the average wheat crop of the country would be worth at ninety cents a bushel.

3. At Peoria, Illinois, a large amount of corn is manufactured into various products. Locate Peoria.

4. Minneapolis has very large flour mills. Where is it situated?

5. How are the Great Lakes and the rivers in the eastern part of the country an advantage to the farmers farther west?

6. Why have such cities as New York and Baltimore become larger on account of the wheat fields of the West?

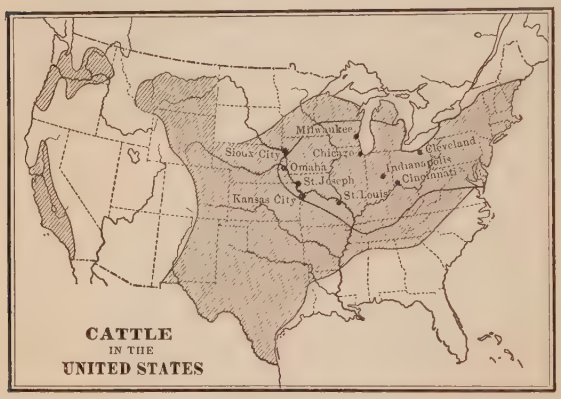
28. **Live Stock**

Cattle, sheep, and swine, so many of which are raised to supply people with food and clothing, are found in greatest numbers in places where their food is most easily obtained. It requires a large amount of land to produce grass and grain for these animals.

Those of us who live in cities and towns may never have seen a large herd of cattle because the land near such localities is too valuable to be devoted to pasturage. On a western ranch a single owner may have as many as twenty thousand cattle.

On account of cheap land for pasturage, the ease of raising corn and other grains for fattening animals, and the climate which is healthful for live stock, the United States raises more cattle than any other country of the world. The number of cattle in the country is nearly as great as that of all the men, women, and children who live in it.

The largest herds of cattle and sheep are pastured on ranches on the Great Plains. The greater part of the land west of the 100th meridian of longitude is too dry for profitable farming, but moist enough during a portion of the year to produce sufficient grass for pasturage. Bunch grass is the most common kind that grows on these plains. When this becomes ripe and dry, it does not spoil as ordinary hay spoils when exposed to the weather, but is always good food for the animals. On portions of the plains this grass is very scanty, and several acres are necessary to support a single animal. On this account a large herd must roam over an immense territory in order to find sufficient food.



CATTLE IN THE UNITED STATES

Before these cattle are ready for the market they need to be fattened with corn. Corn is sometimes shipped West to the ranches from the corn region, but more frequently the cattle are shipped to the corn-producing states. Many a farmer, instead of selling his crop of corn, finds it more profitable to purchase a carload or two of steers from the ranches, feed them corn, and sell them at a much higher price after they are fattened.

On most of the corn-producing farms of these Central

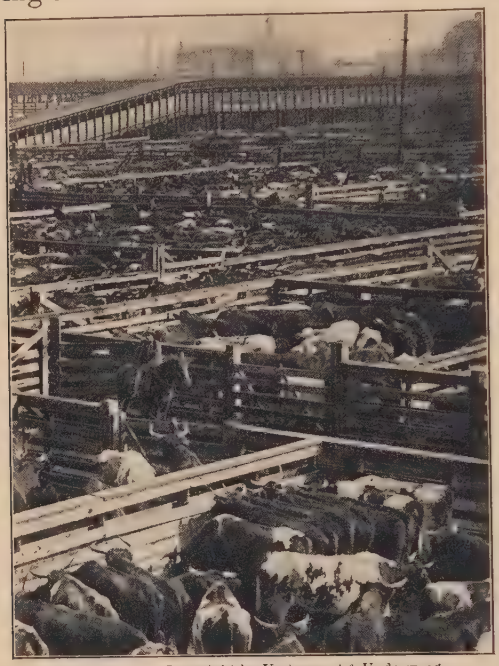
States live stock is raised as the best means of marketing the crop. In addition to other branches of farming more live stock is raised here than on the same amount of territory in the region of the Great Plains. When the animals have been fattened, it costs much less to ship them to market than it would to send the amount of food that they have eaten.

Loading a Cattle Train

We also raise more hogs than any other country. About one third of our immense crop of corn is fed to swine for producing pork. American pork is a common article of food in many foreign countries.

Some cattle are shipped alive across the Atlantic to Europe, in steamships specially fitted for this purpose, but most of the fat cattle, swine, and sheep are sent to meat-packing centers, the largest of which are Chicago, Kansas City, in Kansas, Omaha, and St. Louis.

Chicago is the greatest stock market and meat-packing center in the world. The Union Stock Yards, where animals are unloaded from cars and kept in yards before they are slaughtered, are of astonishing size. They contain twenty miles of streets. It is said that there are one hundred and fifty miles of railroad track in and about the yards for the accommodation of cattle trains. The slaughter houses and meat-packing houses are immense establishments in which thousands of people are employed. The fresh meat when prepared for shipment is sent in refrigerator cars to the various cities of the country. Much of the meat is preserved by salting, smoking, and canning. All parts of the animals are saved for some useful purposes. The blood is used as a fertilizer, the hides are tanned for leather, the hair is used for making cheap cloth, some of the bones are manufactured into knife handles, combs, and buttons, and glue is made from the marrow of the bones.



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Union Stock Yards

Dairying also is a large industry in the Central States. On many of the farms large herds of milch cows are kept for this purpose. The numerous towns and cities are supplied with fresh milk, and train loads of butter and cheese are shipped away week after week to more distant markets.

Horses in a Pasture

The "blue-grass" region in the northern part of Kentucky is one of the richest pasture regions in the world. Many fine trotting horses and saddle horses are raised there.

1. Name in order the states, from North Dakota to Texas, across which the Great Plains extend.
2. Why is there not much dairying on the Great Plains?
3. Name cities through which a train would probably pass in going from Chicago to Boston.
4. About how long would it take for a train to go from Chicago to New York at the rate of thirty miles an hour?
5. Name cities through which a train would be likely to pass in going from St. Louis to Philadelphia.
6. More mules are raised in Missouri than in any other state. Why are they specially useful in that region?
7. St. Joseph has a meat-packing establishment. In what part of Missouri is it?
8. Make a map of the Central Section, showing the location of the meat-packing centers.

29. Various Products

Other products besides wheat and corn are raised in the central farming region. The most important of these are oats, barley, flax, hay, potatoes, tobacco, and fruits.

We grow, in this country, nearly a billion bushels of oats every year. The number of bushels is sometimes greater than that of the wheat crop. Why then do we make so much more account of wheat than of our oats? One answer is that the figures are deceptive, because a bushel of oats weighs only about one half as much as a bushel of wheat. Another answer is that oats are chiefly used as feed for horses and do not attract so much attention as wheat and corn, which are used for human food or to fatten animals for producing human food. Oats are used to some extent for breakfast foods, but only a small amount is required for this purpose.

Loading Oats

More barley is raised in some foreign countries than in our own. It is a kind of grain that will grow and mature in a very short time. It will therefore thrive in the far North, where summers are short. It is raised as

far north as Alaska and Iceland. The principal use of barley in the United States is for producing malt, which is necessary in the process of making beer.

Most of the flax of the United States is raised in the Central States west of the Mississippi River. In some countries of Europe flax is raised chiefly for the purpose of manufacturing linen, but until recently farmers in the

Pulling Flax, Minnesota

United States have raised the crop primarily to obtain the seed, which is called linseed. Only a small amount of linen is produced in this country, and most of that is manufactured into thread and coarse toweling.

Linseed oil, which is pressed from linseed, is used for making paint and for manufacturing oilcloth and linoleum. The remaining part is used as feed for farm animals.

Some fruit of various kinds is raised upon the farms here, as in other parts of the country, but in certain places, where the soil and climate are very favorable, fruit raising is a leading occupation. Some varieties of fruit thrive in the vicinity of the Great Lakes where

the effect of these vast bodies of water is to modify the cold of winter and the heat of summer. There are many large vineyards in the Chautauqua grape belt, which extends along the shore of Lake Erie, through Pennsylvania, into Ohio. Michigan, which is in the midst of the lakes, produces large crops of apples and peaches, and an abundance of other fruits.

Much tobacco is raised in parts of Missouri and southern Wisconsin, where conditions of soil and climate are favorable.

Most of the hemp that this country produces is raised in the blue-grass region of Kentucky. It grows like a crop of tall grain. The seed is used as food for caged birds. Hemp fibers are obtained from the stalks, as fibers of linen are obtained from flax, by soaking and softening the stalks until the fibers can be separated.

The great prairie region is not so destitute of trees as it once was. Most of the settlers have planted trees about their buildings for shade and for protection against violent winds, and large numbers of small tracts have been planted with forest trees for the purpose of producing timber.

In the region of the Great Lakes there are extensive forests of timber. Indeed this region has been regarded as the most important lumber region in the world. The forests of Minnesota, Wisconsin, and Michigan supply the greater part of the white pine lumber of the country. This is in great demand for building purposes, and the supply is rapidly diminishing. Waterfalls in these states, caused by the Ice Sheet, furnish power for manufacturing the lumber, and it is easily shipped away on

the lakes and rivers, as well as by railroads. Such cities as Minneapolis, Duluth, and Superior are great lumber centers.

In the Lumber District, Minneapolis

1. Name the states of this section that are west of the Mississippi River.

2. Why will not many kinds of fruit trees thrive in northern Minnesota?

3. Milwaukee is noted for its large breweries. About how far is it from Chicago?

4. There are large lumber mills at La Crosse and Oshkosh. In what State are they?

5. Saginaw and Bay City are also lumber centers. Where are they situated?

6. Grand Rapids is noted for the manufacture of furniture. In what part of Michigan is it?

7. In what way would lumber probably be shipped from Duluth to Chicago?

8. In what way would it probably be shipped from St. Louis?

9. Make a map of this section, showing the lumber regions and the regions where fruits are extensively raised.

30. Coal and Iron

Anthracite coal, or hard coal, is found in a comparatively small region in northeastern Pennsylvania. The coal of the Central States is bituminous, or soft coal. One very large coal field extends across western Pennsylvania, Ohio, Kentucky, Tennessee, and Alabama. Another covers portions of Indiana and Illinois. There are other fields in the states west of the Mississippi River. (See map on page 56.)

Since wood for fuel is so scarce in this part of the country, it is fortunate that a plentiful supply of coal is near at hand. Cheap coal also makes manufacturing possible in a section where there is little water power.

Coke, which is used for smelting iron ore, is prepared from bituminous coal, and the abundance of this is of great advantage in producing iron and in manufacturing articles from iron and steel.

Formerly most of the iron ore that was used in this country was taken from the Pennsylvania mines, but in recent years it has been obtained in large quantities in the vicinity of Lake Superior, in the states of Michigan, Wisconsin, and Minnesota.

Rich beds of ore were discovered in several small ranges of hills or mountains south and west of the lake. These mines are of great value, not only because they contain vast quantities of iron ore, but especially because the ore can be obtained and smelted at small expense. Iron ore is very common in various parts of the world. It is to be found in many of our states. But it is usually of little value because it is in locations where it

cannot be easily obtained or where it would be expensive to procure coal or coke for smelting it.

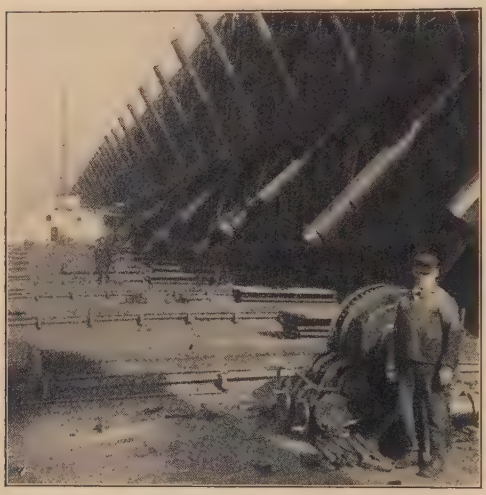
The ore in the Lake Superior district looks like red earth. A part of it is so soft that it can be scooped up with steam shovels and loaded directly on cars. More frequently it is loosened by blasting. In some places it is taken up through shafts from below the surface.

The mines are not very far distant from the lake and the ore is easily drawn to the shore upon short railways. Some of these railways slope slightly from the mines to the lake, and loaded cars will run down to the shore by their own weight.

In an Iron Ore Mine, Mesabi Range, Minn.

The cars are run out upon great piers built high above the lake, and the loads are dumped into bins underneath. Boats then pass under the bins and are quickly loaded. These boats carry the ore to cities on the southern shores of the lakes, where it is unloaded with great steam shovels. It is then either smelted with coke brought from the coal fields which are not far away, or taken by canals or railroads to Pittsburg or to other points in the coal regions.

The great demand for iron and steel and the ease with which ore can be obtained from the Lake Superior district has rendered this an enormous business. One great corporation has over one hundred freight boats engaged in carrying ore.



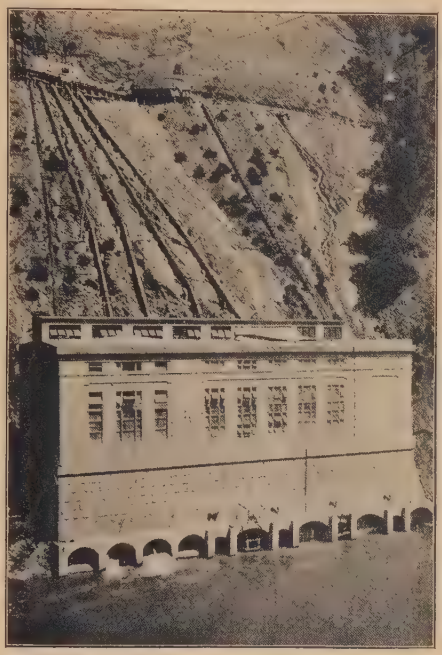
Loading a Ship with Iron Ore

On account of cheap coal and cheap iron ore we produce more iron and steel than any other country, and have become the greatest manufacturing people in the world.

1. Name lake ports that are near the iron mines.
2. The ore at Ishpeming is very soft. Where is Ishpeming?
3. Name several cities on the southern shores of the lakes to which ore may be shipped.
4. What city on the shore of Lake Erie is nearest Pittsburg?
5. How far is it from Pittsburg to Cleveland?
6. How would a vessel from Superior reach Chicago?
7. About how long is the voyage from Superior to Chicago?
8. How would a vessel from Duluth reach Buffalo?
9. Find about how long the voyage is from Duluth to Buffalo.
10. Why is not iron ore sent to the coal fields by railroads?
11. At Buffalo heavy machinery and many car wheels are made. Why is this a favorable place for manufacturing heavy articles of iron?
12. Make a map showing the coal fields and the fields of iron ore in the Central Section.

31. Other Minerals

More than one half of all the copper of the world is obtained in the United States. The value of our copper is now greater than that of all the gold that is brought from our gold mines.



Electric Power House

The use of copper has increased rapidly since the invention of electric lights, telephones, and electric railroads. Copper is a good conductor of electricity. This means that a current of electricity will pass along copper very easily.

Many of the streets, shops, and houses of nearly every city or large town in the country are now lighted by electricity. The electric current is produced at a central power house and goes out along copper wires, which extend through the streets for many miles.

Cars on electric railways are driven by the force of electric currents passing along large copper wires.

We see telephone wires not only on city streets, but

also along many country roads. The telephone has become a great convenience in farm homes. It has rendered country life less lonely. Over one hundred and fifty million pounds of copper a year have recently been used in extending telephone systems.

A Copper Mining Town

The pipe leading up the hill carries away sulphur fumes from the smelter

Brass contains much copper. It is made by melting copper and zinc together. Bronze is composed of copper and tin.

We not only produce copper enough to supply our own wants, but also send a large quantity to Europe and other parts of the world.

The greater part of our copper is obtained in the mountainous states of the West, but there are very rich mines in the northern part of Michigan near the south-

ern shore of Lake Superior. Indians found beds of copper upon the surface when the country was a wilderness, and afterward deep mines were opened.

The rock containing copper ore is broken up and brought to the surface, where it is crushed to powder under powerful hammers in stamp mills. Streams of water then wash away the lighter particles of rock and leave the heavier particles of copper ore. After this the pure copper is separated by smelting.

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Miners coming up from a Calumet and Hecla Shaft

So many people are employed in this work that several large towns have sprung up in the vicinity of the mines.

The largest mine in this region is called the Calumet and Hecla. It is one of the richest and most wonderful mines in the world. It has produced in a single year over one hundred million pounds of copper. It is the deepest mine in the world. Copper ore is found in veins several feet thick, with layers of rock between them. Shafts are sunk down through veins of ore and

from these shafts tunnels are extended through the veins in all directions. Some of the shafts reach down more than four thousand feet below the bottom of Lake Superior.

In this mine there are hundreds of miles of tunnels, similar to the streets of a town. Through these tunnels trains of cars are drawn by electric locomotives. There are real villages of people under the ground with electric lights on the streets, with police officers and a fire department. From the bottom of the mine the people can talk by the telephone with their friends in Chicago or in other cities.

If we should go to the bottom of such a mine, we might find it uncomfortably warm, and this would remind us of the truth of what we have already learned, that the earth in its interior is still very hot. The miners are kept comfortable by draughts of air from the surface.

Lead and zinc are obtained in the Central States. Some is found in Wisconsin, Kansas, and Arkansas, but more is obtained in Missouri. These two metals are found in small pockets embedded in limestone. Lead is a very soft metal. It is used for roofing and for making pipes. Zinc is a harder metal. It is used in making brass and galvanized iron and for various other purposes.

There are many beds of clay in this part of the country. Clay is good for making bricks, but some of finest quality is made into pottery. From a bed of clay near Cincinnati a fine grade of pottery is manufactured in that city. The clay is first moistened and then shaped

on a potter's wheel or with a mold into the form of the article desired. After the article has been dried and hardened by baking in a kiln, it is decorated and then covered with glaze.

In this level section the layers of sandstone and limestone are mostly buried deep beneath the soil, but in some places the rivers have worn their beds through

Work-room in a Pottery

these layers and there the stone may be easily obtained. Large quantities of stone are obtained from quarries in Ohio, Indiana, and Illinois.

1. Name a number of articles that are made of copper.
2. Name a number of articles that are made of brass.
3. Much lead and zinc are mined at Joplin. In what part of Missouri is it?
4. The town of Calumet is near the great copper mine. In what part of Michigan is it?
5. In what part of Ohio is Cincinnati?
6. Beds of clay were formed by the Ice Sheet. Why are there more of them in the Northern States than in the Southern States?
7. Why is no granite easily found in the Central States?

32. Cities near the Great Lakes

We should expect to find most of the large cities of this central part of the country either on the shores of the Great Lakes or along the large rivers, where commerce may be carried on both by boats and by railroads.

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The Heart of Chicago

The great system of lakes is of immense value to the country. Vast quantities of grain, lumber, iron ore, and other articles are shipped across the lakes to the East, and manufactured articles are shipped to the West in return. About one hundred million tons of freight are now transported on the Great Lakes in a year. The cost of shipping goods on lake boats is much less than the cost by railroads. The saving amounts to more than five hundred million dollars a year. Such a great amount of commerce furnishes business for the cities where the goods are shipped or received.

The largest of the lake cities and the second largest in the country is Chicago. Nearly all the railroads that have been built across the northwestern part of the country begin or end at Chicago. It has a central position in the section where vast quantities of grain and live stock are raised. Lumber and iron ore are easily brought on the lakes from the north. Chicago has become the greatest meat-packing center, the greatest grain market, the greatest lumber market, and the greatest railroad center in the world.

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Wisconsin St., Milwaukee

Milwaukee is the largest city in Wisconsin. It is, like Chicago, a trading center for lumber, grain, and live stock. It is specially noted for dealing largely in hides and leather. Many of the skins of animals slaughtered in the meat-packing cities are tanned in Milwaukee with the bark of trees from Wisconsin forests.

The word *Detroit* is a French word that means strait. Detroit is situated at a place where all vessels going east and west must pass, and where railway trains run-

ning between the eastern part of Canada and the West are ferried across the narrow strait. It is a convenient center for the manufacture and shipment of goods.

At Cleveland, which is situated near the coal-fields, much iron ore is handled, and a large amount of machinery

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Lafayette Square, Buffalo

and hardware is manufactured. Many ships are built there for commerce on the lakes. A great amount of petroleum, which is brought through pipes from the petroleum fields, is refined at Cleveland.

Buffalo has a good harbor on Lake Erie and many railroads, and has become a great commercial center. Immense quantities of grain are shipped east from there through the Erie canal and by railroad. Electric light and electric power in Buffalo are obtained from Niagara Falls.

1. Name the capital city of each of the states of this section that border on the Great Lakes.

2. Name the largest city in each of these states.

3. Name all the cities that are situated on the shores of Lake Erie.

4. About how far is Niagara Falls from Buffalo?

5. Explain how Buffalo can use the water power of Niagara Falls.

6. Duluth is the eastern terminus of a railroad to the Pacific coast. Why is that city at a favorable point for such a terminus?

Boat in Lock on St. Mary's Canal

7. Through the St. Mary's Canal more freight is carried than through any other canal in the world. Where is that canal?

8. Name different kinds of freight that pass through the St. Mary's Canal.

9. What will be the effect upon Chicago when boats are able to pass from that city through a canal to the Mississippi River and down the Mississippi Valley to New Orleans?

10. Gary grew quickly from a village to a city of considerable size because immense steel mills were located there. About how far is it from Chicago?

11. Make a map of the region of the Great Lakes, showing the location of all the cities along their shores.

33. Cities along the Rivers

Of the cities situated along the rivers of the central part of the country, St. Louis is the largest. It has a favorable location, as it is near the center of the great Mississippi Valley. It is not only on the Mississippi River, but is also not far from the mouths of the Missouri and the Ohio, and boats can easily reach it

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The Great Eads Bridge at St. Louis

from the north, south, east, or west. Two immense railroad bridges, which cross the Mississippi at St. Louis, have tended to make it a great railroad center. It not only deals largely in grain and live stock, but since it is so far south, it also has a large trade in cotton and tobacco. Great quantities of various kinds of goods are manufactured in St. Louis.

Minneapolis and St. Paul are called the "Twin Cities of the Northwest." They are only a few miles apart, and from their rapid growth it is probable that within a few years they will practically form one city. Near

Minneapolis are the great Falls of St. Anthony, and since the two cities are near the head of navigation of the Mississippi, they have the double advantage of commerce by the river and power from the waterfalls.

The growth of the "Twin Cities" has been remarkable. Only a little more than half a century ago the great Northwest, including what is now Minnesota, western Wisconsin, North Dakota, South Dakota, and

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St. Anthony's Falls and the Milling District, Minneapolis

Montana, was a wilderness of forests and prairies inhabited by roving Indians. Wheat farms upon the prairies and lumber from the forests have increased business so rapidly that these business centers of the section have quickly grown from small villages to great cities.

At Minneapolis there are great sawmills along the banks of the river. Many of these mills are now silent because some of the forests from which they were supplied with logs have been cut away. But the supply of wheat from prairie farms is never failing. The city has over twenty great flour mills, some of which are among the largest flour mills in the world. All of

these mills together are capable of manufacturing fifteen or twenty million barrels of flour in a year. The manufacture of barrels for such a great amount of flour is of itself an industry of much importance.

St. Paul, a short distance farther down the river, has not the advantages for manufacturing that Minneapolis has, but it is the trading center for a great

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Omaha

farming region. From that city the products of the farms are sent east and south, and such articles as farming implements, clothing, and furniture, which the farmers need in return, are sent to the smaller towns.

Kansas City and Omaha on the Missouri River are surrounded by a fertile farming country where much grain and live stock are raised. They are naturally great trading and distributing centers for the farmers. They are near the ranching country where large herds of cattle and sheep are raised and have great advantages for dealing in live stock and packing meats.

The largest city in the valley of the Ohio River, below Pittsburg, is Cincinnati. It is an important manufacturing center. Besides fine pottery made from clay found in the vicinity, it manufactures much machinery and clothing.

In such a rich farming region as this, many important towns and even some large cities spring up at long

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Along the Levee, Cincinnati

distances from the lakes and rivers. Trading centers are necessary for handling the crops of the farms, and the most convenient and natural locations for these are at points where railroads cross one another. Such railroad centers and trading centers are Columbus, in Ohio, and Indianapolis, the capital of Indiana. The latter is the largest city of the United States not situated near navigable water.

1. The largest river city of Indiana is Evansville. It manufactures much flour. In what part of the state is it?
2. Sioux City is a live stock center. Locate it.

3. Deadwood is a mining center in the region of the Black Hills. In what state is it?

4. Fargo is at the head of navigation of the Red River. In what state is it?

5. Kansas City is the name of each of two adjoining cities situated in different states. Name the two states.

6. Louisville is the greatest tobacco market. On what river is it?

7. Name the capital cities of all the states of this section that do not border on the Great Lakes.

8. Name the largest city in each of these states.

9. Make a drawing of the Mississippi, Missouri, and Ohio rivers, and locate upon them the most important cities.

REVIEW

1. Describe the Great Central Plain.
2. Tell about the buffaloes that once lived upon the Great Plains.
3. What mountains are there on the Great Central Plain?
4. How has the soil in the southern part of this section been formed?
5. How long is the Mississippi River?
6. In what part of the course of a river are many falls and cataracts usually found?
7. How are flood plains formed?
8. Why are levees built on the banks of some rivers?
9. Why is the soil near the mouths of rivers usually very fertile?
10. Why do we raise more grain and corn than other countries?
11. How were the Red River Plains formed?
12. Where are our largest wheat farms?
13. How large is our crop of Indian corn?
14. What is done with the greater part of this corn?
15. State several other uses of corn.
16. How are the cattle of the Great Plains fattened for market?
17. Why do not the farmers sell their corn instead of feeding it to live stock?
18. Name several meat-packing centers.
19. Describe the Chicago stock yards.
20. What becomes of our large crop of oats?
21. Where will barley grow, and for what purposes is it used?
22. What is the chief purpose for which flax has been raised in this country?
23. Tell about lumbering in the region of the Great Lakes.
24. In what states are the largest coal-fields of the Central Section?

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The Campus, Detroit

25. From what states of the section is iron ore obtained?
26. Explain the methods of obtaining iron ore.
27. State what is done with the ore.
28. Why do we produce more iron and steel than any other country?
29. How much copper do we obtain from our mines?
30. For what purposes is so much copper used?
31. Tell about the Lake Superior copper mines.
32. How is copper obtained from the mines?
33. Where are lead and zinc found?
34. State purposes for which lead and zinc are used.
35. Explain how the Great Lakes are of much advantage to commerce?
36. Describe the location of Chicago.
37. Explain the leading industries of Chicago.
38. Tell about Milwaukee.
39. Why has Detroit a situation favorable for commerce?
40. What are the leading industries of Cleveland?
41. Why has Buffalo become a great commercial center?
42. Why is St. Louis favorably situated?
43. Tell about the lumber business and flour business of Minneapolis.
44. For what articles is St. Paul a great trading center?
45. What can you say about Kansas City and Omaha?
46. Tell something about Columbus and Indianapolis.

THE WESTERN SECTION

34. Physical Features and Climate

The western part of the United States is a region of wonderful scenery. In sharp contrast with the prairies and plains of the Central Section, it is crossed by mountain ranges extending north into Canada and south into Mexico. Most of the territory between these ranges consists of plateaus which, although low in comparison with the height of the mountains, are yet a mile or more above the level of the sea. Some of the mountains rise to a height of two or three miles above sea level.

Cañon of Crooked River

Showing how the river has cut its course through the Columbia plateau

In the northern part of the section the elevated region through which the Columbia River flows is called the Columbia Plateau. In the southern part the region crossed by the Colorado River is called the Colorado Plateau. In the central part, between these plateaus, there is a lower region

WESTERN STATES
Capitals of States:
Other Cities:
Principal Railroad Lines:
0 50 100 200 300
Scale of Miles
THE M-N. WORKS
Longitude 115° West from Greenwich
DOMINION OF CANADA
WASHINGTON
OREGON
IDAHO
MONTANA
WYOMING
UTAH
COLORADO
NEVADA
ARIZONA
NEW MEXICO
N. DAK.
S. DAK.
NEB.
TEXAS
MEXICO
PACIFIC OCEAN
LOWER CALIFORNIA
Gulf of California
Great Basin
Great Salt Lake
Salt Lake City
Vancouver
Bellingham
Victoria
Port Townsend
Everett
Seattle
Olympia
Tacoma
Spokane
Mt. Rainier
Astoria
Portland
Salem
Albany
The Dalles
Mt. Hood
La Grande
Walla Walla
Baker City
Ashland
Mt. Shasta
Eureka
Kalispell
Great Falls
Missoula
Helena
Butte
Anaconda
Lewiston
Billings
Miles City
Bozeman
Yellowstone National Park
Buffalo
Fremont Pk.
Black Hills
Boise
Pocatello
Rawlins
Laramie
Cheyenne
Ogden
Logan
Evanston
Provo
Longs Peak
Denver
Leadville
Colorado Springs
Cripple Creek
Pikes Pk.
Pueblo
Blanca Peak
Trinidad
Durango
Reno
Virginia City
Carson City
Eureka
Sevier L.
Goldfield
Stockton
Oakland
San Jose
Fresno
Mt. Whitney
Santa Barbara
Pt. Conception
Los Angeles
San Pedro
San Bernardino Range
Mohave Desert
San Diego
Santa Catalina Ist.
Flagstaff
Grand Canyon
Phoenix
Yuma
Tucson
Tombstone
Silver City
Las Cruces
El Paso
Santa Fe
Las Vegas
Albuquerque
Roswell
Rio Grande
Colorado R.
Gila R.
Salt R.
Little Colorado R.
Green R.
Grand R.
San Juan R.
Snake R.
Columbia R.
Milk R.
Missouri R.
Yellowstone R.
Big Horn R.
Powder R.
Little Missouri R.
Cheyenne R.
North Platte R.
S. Platte R.
Arkansas R.
Pecos R.
Humboldt R.
Owyhee R.
Bitter Root Mts.
Wasatch Mts.
Sierra Nevada Mts.
Cascade Range
Coast Range
Sacramento R.
Tulare L.
Tahoe L.
Bear L.
Great Salt Lake Desert
Utah L.
Cape Mendocino
Cape Flattery
Vancouver I.
Juan de Fuca Strait
Puget Sound
Columbia R.
Spokane R.
Wallamette R.
Sacramento
San Francisco
Oakland
San Jose
Santa Barbara
Los Angeles
San Diego
Denver
Pueblo
Santa Fe
Albuquerque
Phoenix
Tucson
Yuma
El Paso
Cheyenne
Salt Lake City
Longitude 115° West from Greenwich

which includes portions of the states of Utah and Nevada. Since this is surrounded by lofty mountains and plateaus, it is called the Great Basin.

In these mountainous regions, in past ages, there were many volcanoes. Some of the highest mountain peaks, such as Mt. Rainier, Mt. Hood, and Mt. Shasta, are the remains of old volcanoes. There are thousands of square miles of land in parts of the West that con-

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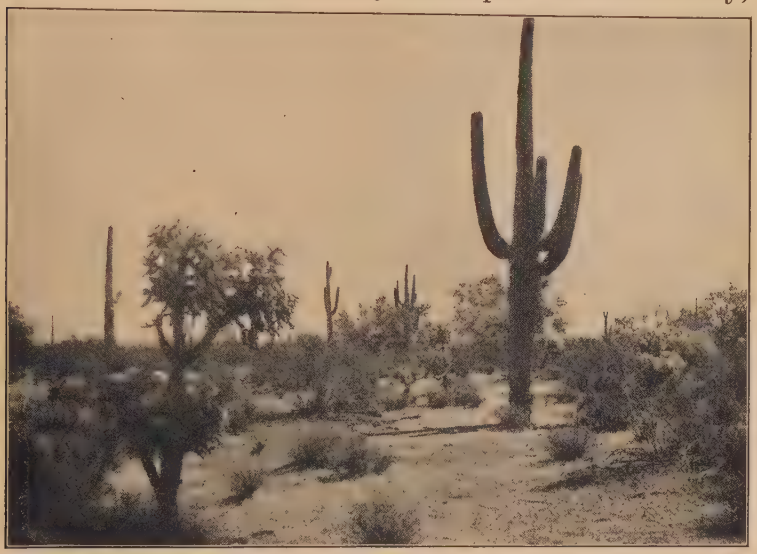
Mt. Shasta, California

sist of beds of lava that once flowed from volcanoes and covered the country. On the surface this volcanic rock has slowly crumbled into soil, and some of the richest farming lands are upon such lava beds. By digging through layers of lava rock the former surface of the land has been found and also the gravel beds of streams that flowed over the country before it was buried under volcanic eruptions.

The scenery of the great West is not more wonderful and varied than its climate. Over the greater part of the section the climate is very dry, or arid. The mois-

ture is mostly brought by westerly winds from the Pacific Ocean. As the winds pass over the mountain ranges near the coast, considerable rain falls. In the western part of the state of Washington there is a greater rainfall than in any other part of the country,



A Forest on the Plains of Southern Arizona

but in passing over the mountains the air becomes so dry that it affords little rain for the plateaus and valleys beyond.

During the winter months there are usually westerly winds and frequent rains along the whole Pacific coast, but in summer these winds mostly cease in the state of California. This causes a rainy season in that state in winter and a dry season in summer.

Over all this large region, extending east from a strip of country near the coast to the central part of the

country, that receives its moisture from the Atlantic Ocean and the Gulf of Mexico, there is a general lack of moisture. Only among the mountains and on high plateaus in northern California, and in the western parts of Oregon and Washington, is the rainfall sufficient to produce timber forests or for farming without irrigation.

Freighting Borax across the Desert

This is the great desert region of the United States. In some parts of it the little rain that occasionally falls furnishes moisture enough to support some varieties of low-growing shrubs, such as sagebrush, greasewood, and mesquite. Many varieties of the cactus plant grow in these desert regions. A tree with thin leaves would lose moisture so fast on the hot desert that it would soon wither, but the cactus plant retains its moisture in its thick, fleshy foliage through a very long period of dry weather.

In portions of Nevada, Utah, and Arizona there are regions so dry that no living plant can be seen upon them for many miles. In some parts of these regions the ground is covered with a kind of salt, or alkali, which remains upon the surface and glistens in the sunlight because there is not rain enough to dissolve it and carry it into the soil.

The water of Great Salt Lake contains about six times as much salt as the same amount of sea water.

On the Shore of Great Salt Lake

A very long time ago this lake was a thousand feet deeper than at present, and it had an outlet to the sea by way of the Snake River and the Columbia River. At that time it must have been a body of fresh water. Most water that we call fresh contains a very small amount of salt. Ponds and lakes that have streams flowing into them, and outlets to carry away the overflow, do not increase in saltness because the salt is carried away as fast as it goes in. In a lake that has no outlet the salt accumulates. Fresh water passes into the air by evaporation, but the salt remains, and after

thousands of years such lakes become very salt. Since that ancient time when the water of Great Salt Lake had an outlet, the climate of that region has become so dry that the amount of water flowing into the lake is not so great as that which evaporates, hence it has slowly settled and its saltness has constantly increased.

Much salt is obtained from this lake. Water is drawn from it into shallow basins, or ponds, and after it evaporates a coating of white salt remains. This is broken up and prepared for the market.

There is a great variation in temperature in different parts of this Western Section. In some low valleys or deserts the thermometer sometimes reaches 110° or even 120° in the shade, while on high plateaus and among the mountains it may be very cool. Along the western coast the temperature is remarkably uniform throughout the year. The westerly winds from the Pacific are comfortably cool in summer and not much colder in winter.

1. Name the states that border on the Pacific Ocean.
2. Name in order the tier of states south of the eastern part of Montana.
3. Name the states south of Idaho.
4. Which is farther north, the northern boundary of Washington or the northern boundary of Maine?
5. Find how many states as large as Connecticut would be contained in the state of Oregon.
6. From the city of Denver, Pikes Peak and Longs Peak are visible. In what directions from that city are they?
7. Why is there more moisture on mountains than on lowlands?
8. Why are there not salt lakes in regions where there is a great amount of rain?
9. Make a map of this section, showing the mountain ranges and the principal rivers.

35. The People

It was a long time after the eastern part of the United States became settled before much was known about the country in the far West. The pioneers who pushed westward over the fertile plains of the Central Section had no attractions to lead them farther when they reached the dry and mountainous regions.

Pueblo of Taos, New Mexico

The Spaniards, who had taken possession of Mexico, occupied a portion of what is now the southwestern part of our country. Many places there retain the Spanish names, as San Francisco, Los Angeles, and Santa Barbara.

The news of the discovery of gold in California in 1849 caused great excitement, and many thousand people in the East left their homes and occupations and hastened to the Pacific coast. Gold was found not only near the coast but also among the mountains farther east. It was not long before explorers found their way

over the entire western section of the country and made settlements in various places. Railroads were built in the lowest passes across the mountains. After the country was explored for mining, other industries sprang up, such as agriculture, stock raising, and lumbering.

The Indians who were found in the southern part of this section, in the territory that is now Arizona and New Mexico, were much more enlightened than those in other parts of the country. On the reservations some of them still follow the customs of their ancestors. Their homes are built of adobe bricks made of clay dried in the sun. Some of the houses are entered through the roofs by ladders.

Many of the Indian homes in New Mexico were called pueblos. These were very large houses containing many rooms, in each of which lived a separate family. They were like whole villages of people under the same roof. Some houses were built on the sides of cliffs and are called cliff dwellings. Others are simply caves dug out of the rock, and are called cave dwellings. The homes were built in such places as these because they could be more easily defended against hostile tribes.

The Moqui Indians in this region still live in pueblos, and many of them are farmers. The Navajos are rich and industrious. They own thousands of horses and sheep. Navajo squaws make very beautiful blankets.

The Indian reservations in this part of the country are numerous, but comparatively small. All of the land that the Indians now have left in the entire country would not amount to much more than one half of

the state of Texas. There would not be great advantage in bringing the scattered tribes together, because they differ widely from one another. More than sixty different Indian languages are spoken in the United States.

There are many thousand Chinese and some Japanese in the states along the western coast. More of these

Navajo Woman weaving a Blanket

people are to be found in the far West than in the East, because they first reach the Pacific coast in crossing from China and Japan.

The states of the Western Section, as a whole, are very sparsely inhabited. This is partly due to the arid climate and partly because of recent settlement. California contains about as many inhabitants as all the other states of the section. Its population, as well as that of Oregon and Washington, is rapidly increasing,

1. Compare the area and population of Nevada and Massachusetts.
2. How do the area and population of the Western States, taken together, compare with the area and population of New England?
3. Why is California more populous than other Western States?
4. There are more Chinese and Japanese in San Francisco and Los Angeles than in any other cities. Locate these cities.
5. Why do many people go to southern California to spend the winter?
6. Why is the Spanish language spoken in Arizona and New Mexico?
7. Why is the population of the states along the Pacific coast increasing rapidly?
8. There was a thriving pueblo where Santa Fé now is, before white people came to America. In what part of New Mexico is Santa Fé?

36. Mining

There is more mining in the western part of the United States than in any other region of the world. Not only gold is obtained there, but also silver, copper, lead, and quicksilver, besides some coal and iron. Rich gold mines were first discovered in California, but at present more gold and silver are found in Colorado than in any other state.

Valuable mineral deposits have been discovered in every one of the Western States. Throughout that region prospectors are continually looking for new mines. A large amount of land in the West still belongs to the government, and any citizen has a right to take a mining claim wherever he can find valuable metals.

Often different metals are found in the same mine. Several of them may be mingled in the same ore. The ore that contains these valuable metals extends through the solid rock of the mountains in layers from a few inches to a few feet thick. Ages ago the spaces occupied by these layers were great cracks, or crevices, in the rock. Water far beneath the surface, which

had become heated very hot in these volcanic districts, dissolved a small amount of the valuable metals and other mineral matter. As this water rose toward the surface in crevices of the rock, it was cooled. It could not then contain so much of the metals and other substances in a dissolved condition, and these were deposited upon the surface of the rocks. In this manner the crevices were entirely filled.

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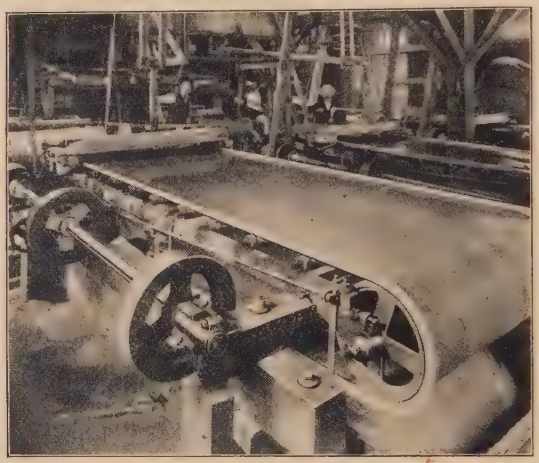
In a Gold Mine, Black Hawk Cañon, Colorado

As the rock of the mountains slowly crumbled and the particles were carried down into the valleys by mountain streams, particles of metals were likewise carried away.

Much gold has been found by washing out particles from the sand of the beds and banks of streams. This method is called placer mining. In the gravel beds of ancient streams, found under the covering of lava rock, much more has been obtained in the same manner.

By a process called hydraulic mining, gold is quickly separated from a large quantity of sand and gravel. A stream of water through a hose is turned against a

gravel bank. The water washes up the sand and carries it down through a trough across which bars of wood are fastened, with quicksilver placed between them. The sand is carried along to the end of the trough, but the heavier particles of gold sink and remain between the bars. The quicksilver attracts the gold and holds it. Afterward the gold is separated from the quicksilver, and the latter is ready to be used again for catching gold.



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Stamp Mill and Gold Concentrator

But the greater part of the valuable metals now obtained in this region is taken from the rocks of the mountains. The ore is first crushed into powder in powerful stamp mills, and the particles of valuable metals are then separated. A common process of separating gold is called the cyanide process. Powdered ore is stirred into a solution of cyanide of potassium and water, in which the gold dissolves. The liquid is then drawn off. Zinc, which has a strong attraction for gold, is placed in the liquid, and the gold attaches itself to the zinc. The zinc and gold combination is then melted, and the two metals are separated.

For extracting silver from powdered ore, water and quicksilver are used. The mixture is stirred by machinery for a long time, and as particles of quicksilver come in contact with particles of silver, they attract the silver and hold it. The quicksilver is then drawn off, and the silver is separated from it by distilling. Heat converts the quicksilver into vapor as it converts water into steam, but the silver remains. When the vapor is cooled, it becomes liquid quicksilver, ready for further use.

Leadville, Colorado

More than a billion dollars worth of silver and more than two billion dollars worth of gold have been taken from the Rocky Mountains.

About four fifths of all the gold obtained in the world is coined into money, and the remainder is manufactured into jewelry, plated wares, watch cases, and gold leaf for gilding and dentistry. About one sixth of all the silver is used for small coins, and the remainder for many purposes with which every one is familiar.

There are other very important metals in this region besides gold and silver. Montana mines more copper

than any other state in the country. It is said that more copper is produced at Butte, in that state, than in any other mining region in the world.

There are rich mines of both lead and silver in the vicinity of Leadville, Colorado, and valuable iron mines in the region west of Pueblo, in the same state. Much quicksilver comes from the northern part of California.

1. Copper is found near the source of the Missouri River. In what state does that river rise?
2. A great amount of copper is mined at Anaconda. In what direction is it from Butte?
3. Gold has been washed out of the gravel of which some of the streets of Helena are composed. Where is that city?
4. Leadville is one of the highest cities in the world. On what mountains is it?
5. Tucson is a mining center. In what part of Arizona is it?
6. Denver is a great distributing center for mining supplies. Locate it.
7. In what direction from Denver is Pueblo?
8. Name uses of quicksilver besides those related to mining.

37. Agriculture

Three conditions are necessary for the growth of farm crops. The soil must contain a sufficient amount of plant food, the climate must be warm enough, and there must be rain enough to supply moisture. In parts of western Washington and Oregon and northern California the rainfall in winter is excessive.

In the rainy season on broad tracts of comparatively level land in Washington and Oregon and in the valleys of California, wheat and other grains are sown, as on the prairie regions in the states farther east. The grain ripens in the spring at about the time when the rains are over, and the dry weather that follows is favorable

for harvesting. In some parts of these states there is so little danger of rain in summer that piles of grain and hay are often left for a long time exposed in the open air, waiting to be sent to market.

The cultivation of hops is an important industry in the State of Washington. The vines climb upon poles, and when the crop is ripe, the hops are picked by hand.

A Washington Hop Field

Much of the harvesting is done by Indian women and children.

The want of moisture has made an arid region of a section of the West that amounts to more than one third of all the land in the United States. On some parts of this "Great American Desert" there is sufficient grass for grazing, and many cattle and sheep and some horses are raised, as they are on the plains east of the Rocky Mountains.

In recent years the amount of desert land in the West has been somewhat reduced by irrigation. By this method the streams that flow down from the mountains

across the lower lands are used to moisten the dry earth and produce fertile farms.

Irrigation is not a new practice. It was used in Egypt three thousand years ago. More than fifty years ago the Mormons, who settled in Utah, began to irrigate the arid land. By the use of water flowing from

Irrigating an Alfalfa Field

the Wasatch range of mountains, they have changed a desert region into rich and productive farming land.

Wherever the land slopes away from a river, some of the water may be conducted by canals and used for irrigation. Some irrigating canals are extended for many miles. Whenever water is needed for the land along the canal, it is drawn through side ditches, and either flows over the surface and floods it, or runs in small ditches made a few feet apart and soaks into the soil.

In order to increase the amount of water that may be used for irrigation during the dry season, large reservoirs are often constructed by building dams across the valleys of streams from the mountains. Large bodies of water

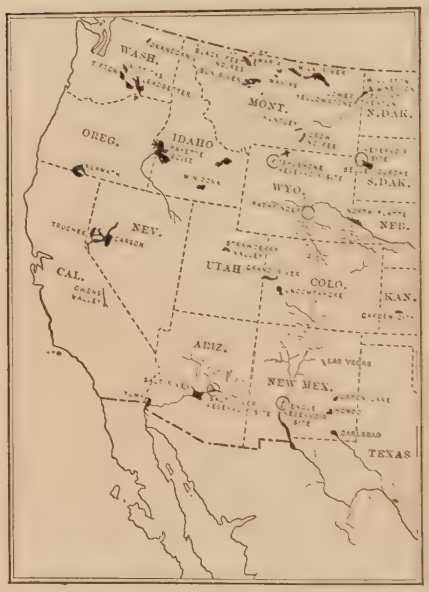
are in this way prevented from running to waste during spring freshets, and the water is afterward drawn through the dams into the rivers as fast as it is needed. Irrigating works are often owned by stock companies, and farmers pay for their supply of water very much as city residents pay for the water they use.

Irrigation Canal, Platte Cañon

The national government is now assisting in irrigating Western lands. With millions of dollars received from the sale and rental of public lands, the government constructs expensive works and afterward permits farmers, who settle upon the land, to pay the expense gradually from the sale of crops.

One of the most interesting of these irrigating systems is that which conducts water from the Colorado River

over portions of the Imperial Valley, in southern California. By depositing mud the river has elevated its bed above the surface of the land. A dam has been constructed across the river, and water is conducted through canals, or ditches, across the sloping desert. As the ditches are extended and more and more land is cultivated, this great stretch of once useless desert is becoming one of the great garden spots of the country.



Reclamation Centers of the West

The black portions show the land to be irrigated by the works the Government has built or is now building.

The states along the Pacific coast are specially noted for producing great quantities of fruit of various kinds, both where there is sufficient rain and elsewhere by irrigation. In the warm valleys of central and southern California, in addition to such fruits as are common in other parts of the country, are raised many oranges, lemons, grape fruit, olives, figs, and choice grapes. In the warm and dry air of summer many grapes, prunes, and other fruits are dried. Both fresh fruit and dried fruit from California have a world-wide reputation.

The California seedless navel orange trees have an interesting history. In the year 1874 two orange trees, which had been grown from cuttings imported from South America by the Agricultural Department of our government at Washington, were sent to a man in California to be tested. The trees throve so well in that climate, and their fruit proved to be so desirable, that

Orange Grove, California

many orange orchards were grafted with buds from these so-called "Washington navels." At that time the orange industry in California was small, but the crop now amounts to many thousand carloads each year.

Many walnuts, almonds, and other nuts are also raised in the valleys of California.

1. Large quantities of wheat are grown in the valleys of the Sacramento and San Joaquin rivers. In what part of California are these valleys?

2. If a car holds 400 boxes of oranges, how many boxes would there be in a California crop of 30,000 carloads?

3. If these oranges were distributed among the people of the country, about how many people would there be for each box of oranges?

4. Why must an irrigation ditch be on the upper side of a field that is to be watered?

5. A large tract of land is irrigated near the city of Denver. From what river is the water obtained?

6. There is irrigated land in the vicinity of Cheyenne and Laramie. In what part of Wyoming are they?

7. The dam built across the Colorado River for irrigating purposes is at Yuma. In what part of Arizona is it?

8. On which side of the Wasatch Mountains is Salt Lake City?

9. Why are farmers whose land is irrigated more certain of raising good crops than those who depend upon rain?

10. Why does it cost more to ship produce from the central part of the country into this mountainous region than to ship it the same distance toward the east?

38. Forests

The forests of the Western States are very valuable. In Washington, Oregon, and northern California there are tracts of timber land more valuable than any of equal size anywhere else in the world. This is because the soil is deep and rich and the rainfall is abundant.

The tall trees of the Pacific States are the marvel of the world. The largest of them are the sequoias, often called the "Big Trees" of California. Their foliage is like that of the cedar, and they belong to the same general family of trees. When full grown, these giant trees may be over three hundred feet tall, and thirty feet in diameter near the ground. When a sequoia tree is cut down, the wood appears in successive rings extending out from the center. Each ring indicates the growth of the tree for a year. The rings of one tree indicated that it had stood over four thousand years.

The sequoias were once widely scattered over the western part of the country, but not many are now left. There are several groves of them on the western slopes

of the Sierra Nevada Mountains, and some of these are protected from further destruction and set apart as public parks by the state and national governments.

In northwestern California are the famous forests of redwood trees, which are regarded as cousins of the sequoias, but which grow only on the lower lands. In

Among the Big Trees, Mariposa, California

Washington and Oregon the most common forest tree is the Douglas fir, but there are also many pine, spruce, cedar, and hemlock trees.

In the arid regions at a greater distance from the coast there is sufficient rain upon the mountains to support the growth of forests. Even in Arizona and New Mexico there are extensive forests of pine.

A large amount of lumber is used in the mines of the Western States, since many heavy timbers are required to prevent the mines from caving in, but much valuable western timber is also shipped to foreign countries.

There are so many forests in different parts of the

country that we might be led to suppose that we shall always have an abundant supply of wood and lumber, but it has been found that we are cutting down the trees twice or three times as fast as they will grow. If this should continue without change, it would not be very long before all the forests would disappear. This would mean a famine in lumber and fuel and also heavy loss in other ways.

Forest trees are a greater benefit to the country than most persons imagine. They keep the soil moist and probably increase the rainfall. When a shower of rain falls upon the dry surface of naked hills, the greater part of the water runs quickly down the slopes into brooks and then into rivers and so on toward the ocean. But where the hills are covered with forests, decaying leaves on the ground hold the water like a sponge. The roots of the trees also make the surface of the ground uneven, and produce numerous little basins which become pools of water. The water thus held back slowly soaks into the ground and moistens it. Some of it afterward passes into the air by evaporation and helps to produce rain again.

As rain water flows down the slopes of treeless hills, it carries away much of the finest and best soil and deposits it in the rivers or in the ocean.

But only a part of the story has yet been told. The flow of water in rivers, upon which manufacturing, navigation, and irrigation are dependent, is largely regulated by forests. These hold back a large amount of water in times of heavy rain, and thus prevent damaging floods. The water thus held in reserve

slowly soaks into the soil and gradually trickles out again in springs and brooks, which keep up the flow of rivers for manufacturing, irrigation, and river traffic through periods of drought. On the other hand, where trees are wanting, a great quantity of water may find its way quickly into rivers and cause destructive

Lumbering in Washington

freshets, and soon after these are over, the mills, the irrigation ditches, and the river boats may be in need of the water that has passed on so rapidly to the sea.

Millions of dollars are expended in making rivers navigable by removing from their channels mud that has been washed down from the unprotected hills.

If a new tree were permitted to grow in the place of every large one that is cut down, there might be some hope of saving the forests, but lumbermen are usually careless about this matter, and often destroy all trees, both large and small. Millions of dollars worth of

forests are destroyed every year by fires which are frequently started through carelessness.

Our government has recently taken measures to protect as much forest land as possible. Many of the forests on government land have been set apart as forest reserves. There are now over one hundred of such reserves, and they are mostly in the Western States.

The black portions indicate the present reserves; the shaded sections in the east show the proposed Appalachian and White Mountain reserves

They are in the charge of government employees, called forest rangers. These men ride about on horseback through the forests to prevent fires, to take charge of the sale of full-grown trees, and to enforce the game laws. Young men who enter this service must be able to compute the amount of lumber in trees. They must know how to put up a tent, to manage a wild horse, and to fight fire, and they must be familiar with the laws for protecting game.

The government is striving to persuade private landowners to plant young trees and help to increase the

amount of forest land. The governments of some of the states have also purchased timber lands and are holding them as forest reserves.

1. Name several other large timber sections in the country besides those in the Western States.

2. The National Bureau of Forestry is trying to find substances that will take the place of wood. Why should it do this?

3. If our forest reserves should amount to 160,000,000 acres, find how many square miles they would cover.

4. Regarding the land area of the United States as 3,000,000 square miles, find about what part of all the territory of the country the forest reserves would cover.

5. Why are there larger forest trees on the western slopes of the mountains near the Pacific than on the eastern slopes?

6. A large amount of redwood lumber is shipped from the port of Eureka. On what part of the California coast is it?

7. Some of the largest lumber mills in the world are on Puget Sound. Why should there be large lumber mills there?

8. Make a map of the Western States, and indicate, by shading, the location of the principal forest reserves.

39. Cities

In a region so arid and so sparsely populated as the Western States we should expect to find but few large cities, and these chiefly along the western coast.

The finest harbor on the Pacific coast is in San Francisco Bay. This bay was formed by a slight sinking of the coast, which made deeper water in the valley of the Sacramento River. The great interest in gold mining in California, which was aroused in 1849, gave San Francisco a vigorous start, and since then its size has rapidly increased.

In the year 1906 a large part of the city was laid in ruins by a terrible earthquake and a fire that followed

the earthquake. Many thousands of its people were made homeless, and for a time its population was much reduced. But since then the city has been recovering so rapidly as to astonish the world. It is the great central port of our Western coast, and from it steamships make their trips to the Hawaiian Islands, the Philippines, Japan, China, Australia, South America, Europe, and cities of our Eastern coast.

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Canning Salmon

The city of Oakland, across the bay from San Francisco, is really a part of the same commercial center.

Ocean vessels can proceed up the Columbia River and the Willamette River, as far as Portland, Oregon, which is about one hundred miles from the Pacific. Immense quantities of flour from the mills of Portland are exported to China and Japan.

Salmon fishing on the Columbia River and in bays along the coast is a business of great importance. The young salmon are first hatched in the mountain streams that form the source of the Columbia, and soon swim down the river to the sea. After four or five years

they strive to find their way up to the sources of the river again, where they may lay their eggs and thus complete their life history. At such a time great quantities of the fish are easily caught in nets. The fish wheel, which is also used for catching salmon, operates in a peculiar manner. A kind of water wheel with

A View in Seattle

nets attached is fastened to a boat and placed in the river where the fish are accustomed to swim. The current keeps the wheel turning, and as the fish swim into the nets they are carried up and dropped into the boat. Some salmon from the Pacific coast are shipped fresh to Eastern markets, but more are canned in factories along the river. Canned salmon from the Columbia River is well known in the markets of the world.

There are excellent harbors on Puget Sound where the cities of Seattle and Tacoma are situated. These harbors and the cities located by them have come into great prominence since the United States has begun to

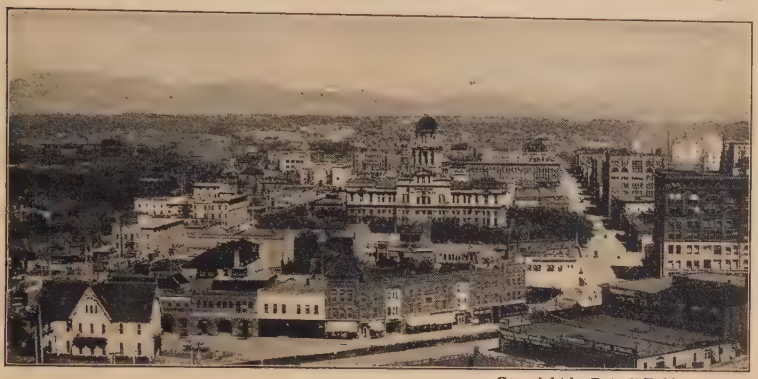
increase its trade with the countries across the Pacific, and since gold mines were discovered in Alaska. Seattle and Tacoma are near the great forests, and lumber mills have added much to their industries. Seattle is the largest city of the Northwest and is growing very rapidly.

Los Angeles, looking south from the Court House

In southern California the chief city is Los Angeles. It is the center for a rich fruit-growing district. Although it is at some distance from the sea, a railroad connects it with the port of San Pedro, where the harbor is protected by a breakwater upon which the government has expended nearly three million dollars. Many people who remove to southern California because of the favorable climate make their abode in Los Angeles, so that its population increases rapidly. The enterprise of that city is manifested in the fact that it has been expending over twenty million dollars for the purpose of conducting from Mt. Whitney, which is two hundred

and forty miles away, sufficient water to supply a large city, and besides this, to irrigate thousands of acres.

San Diego is situated upon an excellent harbor near the southern limit of our Pacific coast. Balmy breezes from the Pacific give it a delightful climate in both winter and summer. Coronado Beach, near San Diego,



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Denver, Colorado

is a famous resort for rest and recreation. When the Panama Canal is completed, this will be the nearest American port for ships passing up the Western coast, and the harbor will then be of great importance.

Denver is the largest of the inland cities of the West. It is situated at the foot of the Rocky Mountains, in the vicinity of a rich mining district, and at a point where there is sufficient water for irrigating a large territory of fertile land. It has become a great railroad center. Large quantities of ore from neighboring mines are taken to Denver for smelting. Because it is in an elevated region and has a dry climate, it is a resort for many persons who are affected with lung troubles.

Spokane, in Washington, is near the falls of Spokane River, and in the midst of a great wheat-producing country. It manufactures flour and lumber.

The Falls at Spokane

1. Name the capital city of each of the Western States.
2. Name the largest city of each of these states.
3. Colorado Springs is a popular health resort. In what direction is it from Denver?
4. Ogden is a great railroad center. In what direction is it from Salt Lake City?
5. Santa Barbara is a popular health resort. About how far is it from Los Angeles?
6. Sacramento and San José are important centers for fruit trade. In what direction is each of these from San Francisco?
7. Stockton is a grain-shipping center and has large flour mills. In what river valley is it?
8. Make a map of the Western States, showing the location of all the cities that have been mentioned.

40. Interesting Localities

The Western States contain many points of interest and much attractive scenery. Among the Rocky Mountains and the Sierras there are sections as grand

as in the Alps of Switzerland. A trip by railroad across these ranges of mountains affords a great variety of scenery. For a time the train may

Georgetown Loop, Colorado

pass through a deep gorge beside the roaring torrent of some river. Later it will move in curves around mountain sides and perhaps form a loop by making a complete circuit in its steady upward climb, with the snow-capped summits of the mountains above and deep valleys below.

The mountains are mostly covered with trees, but where they are bare, the rocks and soil present a variety of coloring. Many wonderful forms have been carved in the rocks by the forces of nature during the long ages of the past.

In the Garden of the Gods in Colorado, rocks of many colors have been so worn by sand blown against them and by other causes that, when seen at a distance from the mountains, they appear like a garden of flowers.

One of the popular pleasure resorts of the West is the region of the Yosemite Lake and the Yosemite River,

Gateway to the Garden of the Gods

located on the western slope of the Sierra Nevada range of mountains in central California. The lake is now included in a national reserve called the Yosemite National Park. The park also contains some of the sequoias, or Big Trees.

The river that flows from the lake leaps over a precipice fifteen hundred feet high, then passes on in a series of waterfalls and cascades.

The Mariposa Grove, which adjoins the Yosemite Park, also contains many of the Big Trees. It is a reserve set apart by the state of California.

A much more wonderful and celebrated national park is the Yellowstone Park, lying between the states of Wyoming, Montana, and Idaho. It contains more than a thousand hot springs and geysers. Some of the springs consist of boiling mud. One of these covers

The Yosemite Valley

more than an acre, and looks like an immense pot of paint. Boiling water flows from other springs, and gradually cools as it falls over a series of terraces. The hot water contains various kinds of matter, and as it cools some of this matter is deposited, showing a variety of beautiful colors. One of the springs, by its deposits of this matter, has built up a white hill more than two hundred feet high.

The geysers are the most wonderful objects in the park. Through the explosion of steam produced by the

hot rocks beneath, they throw streams of boiling water high into the air. Some of them are active at intervals of about an hour, and others at intervals of several hours, or even of several days. The Grand Geyser is the greatest in the world. It throws its stream to a height of more than three hundred feet.

The Yellowstone Lake is a beautiful sheet of water among the mountains, eight thousand feet above the level of the sea. The river flows down by a succession of falls and through a gorge, or cañon, one thousand feet deep, the walls of which are rendered extremely beautiful by a variety of coloring.

Grand Geyser, Yellowstone Park

The grandest of all this scenery, to which many thousands of travelers are attracted, is the great gorge in Arizona, called the Grand Cañon of the Colorado River. In comparison with this the gorges or cañons of all other rivers in the country fall into insignificance. As we go

to the brink of the cañon and look down the sides, we behold vast embankments consisting of layers upon layers colored in red, yellow, brown, and gray. Across to the edge on the other side it is a distance of ten or twelve miles, and if we should wish to go over, it would be necessary to travel for hundreds of miles, because

Grand Cañon of the Colorado River

there is no bridge or way across, and the cañon is three hundred miles long.

Down at the bottom, at a distance of a mile below us, the river looks like a mere brook winding its way along. If we follow the path that leads down, we must undertake a difficult walk of several miles, and when we reach the river, we shall seem to be shut in between lofty walls with a long and narrow strip of sky above.

Vast as may seem this piece of carving out of the face of the earth, it is all the work of the stream of water

now flowing at the bottom. There was a time when the river flowed along the surface, which is a mile above its present bed. As this region was slowly elevated the slope of the bed of the river was increased, and the cañon was gradually deepened.

As we have learned that all streams of swiftly flowing water slowly wear away their channels, so this river, during past ages, has wrought its mighty work. If we look for the material that has been removed in making this gigantic carving, we shall find that it has been used for filling the bed of the gulf and producing a vast river delta.

1. The railroad from Leadville to Pueblo passes through a deep gorge, close to the river, and a part of the way over the river. What river is it?

2. The Garden of the Gods is near Pikes Peak. In what direction is it from Denver?

3. In what direction from San Francisco is the Yosemite National Park?

4. Into what river does the Yosemite River flow?

5. In what mountain system is the Yellowstone Park?

6. Into what river does the Yellowstone River flow?

7. Compare the size of the Yellowstone Park with that of the state of Rhode Island.

8. Through what states and along the border of what states does the Colorado River flow?

9. Into what body of water does the Colorado River flow?

REVIEW

1. Describe the physical features of the Western Section.

2. Where are the Columbia Plateau, the Colorado Plateau, and the Great Basin?

3. Give the names of some extinct volcanoes.

4. What have been the effects of volcanic eruptions in this part of the country?

5. Why are the plateaus and valleys of the Western Section mostly arid?

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Portland and Mt. Hood

6. What vegetation grows in these desert regions?
7. Explain how Great Salt Lake has become very salt.
8. How is salt obtained from the water of Great Salt Lake?
9. Tell about the temperature of the Western Section.
10. What part of this section did the Spaniards once occupy?
11. Explain how California became settled.
12. Tell about the Indians of Arizona and New Mexico.
13. Where are most of the Indians now located?
14. Why are there many Chinese and Japanese in the states along the Pacific coast?
15. Why is the population of the Western States very sparse?
16. What minerals are obtained in the Western States?
17. How were metals formed in the rocks of the mountains?
18. Explain placer mining and hydraulic mining.
19. Explain the cyanide process of extracting gold from ore.
20. Explain how silver is obtained from ore.
21. For what purposes are gold and silver used?
22. Where is much quicksilver found?
23. State three conditions that are necessary for successful agriculture.
24. Tell about the wheat crop of the Pacific States.
25. Explain the hop industry.
26. How large is the Great American Desert?
27. State how the Mormons have prospered by irrigation.
28. Explain the process of irrigation.

29. How does the building of dams across mountain streams aid in irrigation?
30. State how the government is assisting in the work of irrigation.
31. Describe the irrigation works of the Imperial Valley.
32. Which of the Western States produce much fruit?
33. What special kinds of fruit thrive in southern California?
34. Give the history of the Washington navel orange.
35. Tell about the forests of the Western States.
36. Describe the "Big Trees" of California.
37. Where are the redwood forests?
38. What trees are common in Washington and Oregon?
39. How do forest trees increase moisture and rainfall?
40. How do they prevent much soil from being carried away?
41. How is the flow of water in rivers regulated by forests?
42. How do forests prevent rivers from becoming filled with mud?
43. Tell about our forest reserves.
44. Why are there but few large cities in the Western States?
45. Tell about the harbor of San Francisco.
46. Tell about the San Francisco earthquake.
47. Describe the location of Portland, Oregon.
48. Tell about the salmon industry.
49. Why have Seattle and Tacoma a favorable location?
50. Tell about Los Angeles.
51. What advantages has San Diego?
52. Describe the location of Denver.
53. Describe a trip by railroad across the mountains of the West.
54. Describe the Garden of the Gods.
55. What are the interesting attractions in the Yosemite National Park?
56. What is the Mariposa Grove?
57. Give a description of the Yellowstone Park.
58. Describe the Grand Cañon of the Colorado River.
59. Explain how the river has produced this cañon.

THE WORLD
ON MERCATOR'S PROJECTION
Scale of Miles along the Equator
0 1000 2000 3000 4000 5000
Longitude East from Greenwich
Longitude West from Greenwich
Longitude East
ARCTIC OCEAN
ASIA
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
OCEANICA
AUSTRALIA
AFRICA
EUROPE
NORTH AMERICA
SOUTH AMERICA
DOMINION OF CANADA
UNITED STATES
Greenland
ICELAND
SPITZBERGEN
FRANZ JOSEF LAND
NOVA ZEMBLA
North Cape
C. Chelyuskin
East Cape
C. Prince of Wales
ALASKA
Bering Sea
Hudson Bay
Davis Strait
C. Farewell
ARCTIC CIRCLE
Rocky Mts.
Victoria
Seattle
Ottawa
Halifax
NEWFOUNDLAND
Chicago
New York
San Francisco
Washington
Peking
JAPAN
Tokio
CHINA
Himalaya Mts.
Hongkong
Manila
PHILIPP NE ISLANDS
GUAM
Singapore
Honolulu
HAWAIIAN ISLANDS
CUBA
PORTO RICO
C. Verde
EQUATOR
EAST INDIES
SAMOA
TUTUILA
FIJI
TROPIC OF CAPRICORN
Melbourne
Sydney
NEW ZEALAND
C. St. Roque
Rio de Janeiro
Buenos Aires
Andes Mts.
Cape Horn
Johannesburg
Cape Town
Cape of Good Hope
St. Petersburg
Ural Mts.
BRITISH ISLES
North Sea
London
Berlin
Paris
THE ALPS
PYRENEES
Gibraltar
Mediterranean Sea
ATLAS MTS.
Alexandria
Cairo
TROPIC OF CANCER
Constantinople
CAUCASUS MTS.
Himalaya Mts.
Calcutta
Arabian Sea
Bay of Bengal
THE M.-N. WORKS

APPENDIX

Area and Population

	Area in Square Miles	Population 1900	Population 1910
Alabama	51,998	1,828,697	2,138,093
Arizona	113,956	122,931	204,354
Arkansas	53,335	1,311,564	1,574,449
California	158,297	1,485,053	2,377,549
Colorado	103,948	539,700	799,024
Connecticut	4,965	908,420	1,114,756
Delaware	2,370	184,735	202,322
District of Columbia	70	278,718	331,069
Florida	58,666	528,542	752,619
Georgia	59,265	2,216,331	2,609,121
Idaho	84,313	161,772	325,594
Illinois	56,665	4,821,550	5,638,591
Indiana	36,354	2,516,462	2,700,876
Iowa	56,147	2,231,853	2,224,771
Kansas	82,158	1,470,495	1,690,949
Kentucky	40,598	2,147,174	2,289,905
Louisiana	48,506	1,381,625	1,656,388
Maine	33,040	694,466	742,371
Maryland	12,327	1,188,044	1,295,346
Massachusetts	8,266	2,805,346	3,366,416
Michigan	57,980	2,420,982	2,810,173
Minnesota	84,682	1,751,394	2,075,708
Mississippi	46,865	1,551,270	1,797,114
Missouri	69,420	3,106,665	3,293,335
Montana	146,572	243,329	376,053
Nebraska	77,520	1,066,300	1,192,214
Nevada	110,690	42,335	81,875
New Hampshire	9,341	411,588	430,572
New Jersey	8,224	1,883,669	2,537,167
New Mexico	122,634	195,310	327,301
New York	49,204	7,268,894	9,113,614

	Area in Square Miles	Population 1900	Population 1910
North Carolina	52,426	1,893,810	2,206,287
North Dakota	70,837	319,146	577,056
Ohio	41,040	4,157,545	4,767,121
Oklahoma	70,057	790,391	1,657,155
Oregon	96,699	413,536	672,765
Pennsylvania	45,126	6,302,115	7,665,111
Rhode Island	1,248	428,556	542,610
South Carolina	30,989	1,340,316	1,515,400
South Dakota	77,615	401,570	583,888
Tennessee	42,022	2,020,616	2,184,789
Texas	265,896	3,048,710	3,896,542
Utah	84,990	276,749	373,351
Vermont	9,564	343,641	355,956
Virginia	42,627	1,854,184	2,061,612
Washington	69,127	518,103	1,141,990
West Virginia	24,170	958,800	1,221,119
Wisconsin	56,066	2,069,042	2,333,860
Wyoming	97,914	92,531	145,965
Total	3,026,789	75,994,577	91,641,197

Population of Cities of over 35,000

	Population 1900	Population 1910		Population 1900	Population 1910
Akron, Ohio	42,728	69,067	Butte, Mont.	30,470	39,165
Albany, N.Y.	94,151	100,253	Cambridge, Mass.	91,886	104,839
Allentown, Pa.	35,416	51,913	Camden, N.J.	75,935	94,538
Altoona, Pa.	38,973	52,127	Canton, Ohio	30,667	50,217
Atlanta, Ga.	89,872	154,839	Charleston, S.C.	55,807	58,833
Atlantic City, N.J.	27,838	46,150	Chattanooga, Tenn.	30,154	44,604
Augusta, Ga.	39,441	41,040	Chester, Pa.	33,988	38,537
Baltimore, Md.	508,957	558,485	Chicago, Ill.	1,698,575	2,185,283
Bay City, Mich.	27,628	45,166	Cincinnati, Ohio	325,902	364,463
Bayonne, N.J.	32,722	55,545	Cleveland, Ohio	381,768	560,663
Berkeley, Cal.	13,214	40,434	Columbus, Ohio	125,560	181,548
Binghamton, N.Y.	39,647	48,443	Covington, Ky.	42,938	53,270
Birmingham, Ala.	38,415	132,685	Dallas, Tex.	42,638	92,104
Boston, Mass.	560,892	670,585	Davenport, Iowa	35,254	43,028
Bridgeport, Conn.	70,996	102,054	Dayton, Ohio	85,333	116,577
Brockton, Mass.	40,063	56,878	Denver, Colo.	133,859	213,381
Buffalo, N.Y.	352,387	423,715	Des Moines, Iowa	62,139	86,368

	Population 1900	Population 1910
Detroit, Mich.	285,704	465,766
Dubuque, Iowa	36,297	38,494
Duluth, Minn.	52,969	78,466
East St. Louis, Ill.	29,655	58,547
Elizabeth, N.J.	52,130	73,409
Elmira, N.Y.	35,672	37,176
El Paso, Tex.	15,906	39,279
Erie, Pa.	52,733	66,525
Evansville, Ind.	59,007	69,647
Fall River, Mass.	104,863	119,295
Fitchburg, Mass.	31,531	37,826
Flint, Mich.	13,103	38,550
Fort Wayne, Ind.	45,115	63,933
Fort Worth, Tex.	26,688	73,312
Galveston, Tex.	37,789	36,981
Grand Rapids, Mich.	87,565	112,571
Hamilton, Ohio	23,914	35,279
Harrisburg, Pa.	50,167	64,186
Hartford, Conn.	79,850	98,915
Haverhill, Mass.	37,175	44,115
Hoboken, N.J.	59,364	70,324
Holyoke, Mass.	45,712	57,730
Houston, Tex.	44,633	78,800
Indianapolis, Ind.	169,164	233,650
Jacksonville, Fla.	28,429	57,699
Jersey City, N.J.	206,433	267,779
Johnstown, Pa.	35,936	55,482
Kalamazoo, Mich.	24,404	39,437
Kansas City, Kan.	51,418	82,331
Kansas City, Mo.	163,752	248,381
Knoxville, Tenn.	32,637	36,346
Lancaster, Pa.	41,459	47,227
Lawrence, Mass.	62,559	85,892
Lexington, Ky.	26,369	35,099
Lincoln, Neb.	40,169	43,973
Little Rock, Ark.	38,307	45,941
Los Angeles, Cal.	102,479	319,198
Louisville, Ky.	204,731	223,928
Lowell, Mass.	94,969	106,294
Lynn, Mass.	68,513	89,336
Macon, Ga.	23,272	40,665
Malden, Mass.	33,664	44,404
Manchester, N.H.	56,987	70,063
McKeesport, Pa.	34,227	42,694
Memphis, Tenn.	102,320	131,105
Milwaukee, Wis.	285,315	373,857
Minneapolis, Minn.	202,718	301,408
Mobile, Ala.	38,469	51,521
Montgomery, Ala.	30,346	38,136
Nashville, Tenn.	80,865	110,364
Newark, N.J.	246,070	347,469
New Bedford, Mass.	62,442	96,652
New Britain, Conn.	25,944	43,916
Newcastle, Pa.	28,339	36,280
New Haven, Conn.	108,027	133,605
New Orleans, La.	287,104	339,075
Newton, Mass.	33,587	39,806
New York, N.Y.	3,437,202	4,766,883
Norfolk, Va.	46,624	67,452
Oakland, Cal.	66,960	150,174
Oklahoma City, Okla.	10,039	64,205
Omaha, Neb.	102,555	124,096
Passaic, N.J.	27,777	54,773
Paterson, N.J.	105,171	125,600
Pawtucket, R.I.	39,231	51,622
Peoria, Ill.	56,100	66,950
Philadelphia, Pa.	1,293,697	1,549,008
Pittsburg, Pa.	321,616	533,905
Portland, Me.	50,145	58,571
Portland, Ore.	90,426	207,214
Providence, R.I.	175,597	224,326
Pueblo, Colo.	28,157	44,395
Quincy, Ill.	36,252	36,587
Racine, Wis.	29,102	38,002
Reading, Pa.	78,961	96,071
Richmond, Va.	85,050	127,628
Rochester, N.Y.	162,608	218,149
Rockford, Ill.	31,051	45,401
Sacramento, Cal.	29,282	44,696
Saginaw, Mich.	42,345	50,510
St. Joseph, Mo.	102,979	77,403
St. Louis, Mo.	575,238	687,029
St. Paul, Minn.	163,065	214,744
Salem, Mass.	35,956	43,697
Salt Lake City, Utah	53,531	92,777
San Antonio, Tex.	53,321	96,614
San Diego, Cal.	17,700	39,578
San Francisco, Cal.	342,782	416,912
Savannah, Ga.	54,244	65,064
Schenectady, N.Y.	31,682	72,826

	Population 1900	Population 1910		Population 1900	Population 1910
Scranton, Pa.	102,026	129,867	Topeka, Kan.	33,608	43,684
Seattle, Wash.	80,671	237,194	Trenton, N.J.	73,307	96,815
Sioux City, Iowa	33,111	47,828	Troy, N.Y.	60,651	76,813
Somerville, Mass.	61,643	77,236	Utica, N.Y.	56,383	74,419
South Bend, Ind.	35,999	53,684	Washington, D.C.	278,718	331,069
Spokane, Wash.	36,848	104,402	Waterbury, Conn.	45,859	73,141
Springfield, Ill.	34,159	51,678	West Hoboken, N.J.	23,094	35,403
Springfield, Mass.	62,059	88,926	Wheeling, W. Va.	38,878	41,641
Springfield, Mo.	23,267	35,201	Wichita, Kan.	24,671	52,450
Springfield, Ohio	38,253	46,921	Wilkes-Barre, Pa.	51,721	67,105
Superior, Wis.	31,091	40,384	Wilmington, Del.	76,508	87,411
Syracuse, N.Y.	108,374	137,249	Woonsocket, R.I.	28,204	38,125
Tacoma, Wash.	37,714	83,743	Worcester, Mass.	118,421	145,986
Tampa, Fla.	15,839	37,782	Yonkers, N.Y.	47,931	79,803
Terre Haute, Ind.	36,673	58,157	York, Pa.	33,708	44,750
Toledo, Ohio	131,822	168,497	Youngstown, Ohio	44,885	79,066

Longest Rivers

	Length in Miles		Length in Miles
Mississippi (including Missouri)	4,350	Platte	900
Missouri	3,100	Connecticut	450
St. Lawrence	2,200	James	450
Arkansas	2,170	Potomac	400
Colorado	2,000	Sacramento	400
Rio Grande	1,800	Susquehanna	400
Columbia	1,400	Delaware	300
Ohio	975	Hudson	300

Highest Mountains

	Height in Feet		Height in Feet
Mt. Whitney, Cal.	14,900	Fremont Peak, Wyo.	13,790
Mt. Rainier, Wash.	14,530	Mt. Hood, Ore.	11,220
Mt. Shasta, Cal.	14,440	Mt. Mitchell, N.C.	6,710
Longs Peak, Col.	14,270	Mt. Washington, N.H.	6,290
Pikes Peak, Col.	14,147	Mt. Marcy, N.Y.	5,344

INDEX AND PRONOUNCING VOCABULARY

KEY TO PRONUNCIATION

a, as in *fat*; *ā*, as in *fate*; *ä*, as in *far*; *â*, as in *fall*; *e*, as in *pen*; *ē*, as in *mete*; *ė*, as in *her*; *i*, as in *pin*; *ī*, as in *pine*; *o*, as in *not*; *ō*, as in *note*; *ö*, as in *move*; *u*, as in *tub*; *ū*, as in *mute*; *ü*, as in *pull*; *g*, as in *get*; *ġ*, as in *gem*; *c*, as in *cat*; *ç*, as in *cent*.

A double dot under a or o (ạ, ọ) indicates that its sound is shortened to that of *u* in *but*.

Italicized letters are silent. The sign ′ tells upon which syllable the accent is placed. The numbers refer to pages in the book.

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